



SCIENCE

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Name :

Class :



4th PRIMARY Second Term

THEME THREE:

PROTECTING OUR PLANET

UNIT THREE:

ENERGY AND FUEL



Unit 3 concept 1

Devices and energy

Energy

It is the ability to do work.

forms of energy :

(heat energy, Light energy Chemical energy).

Devices and energy

energy Transform from one form To another

ex:-electric energy

change into

sound energy



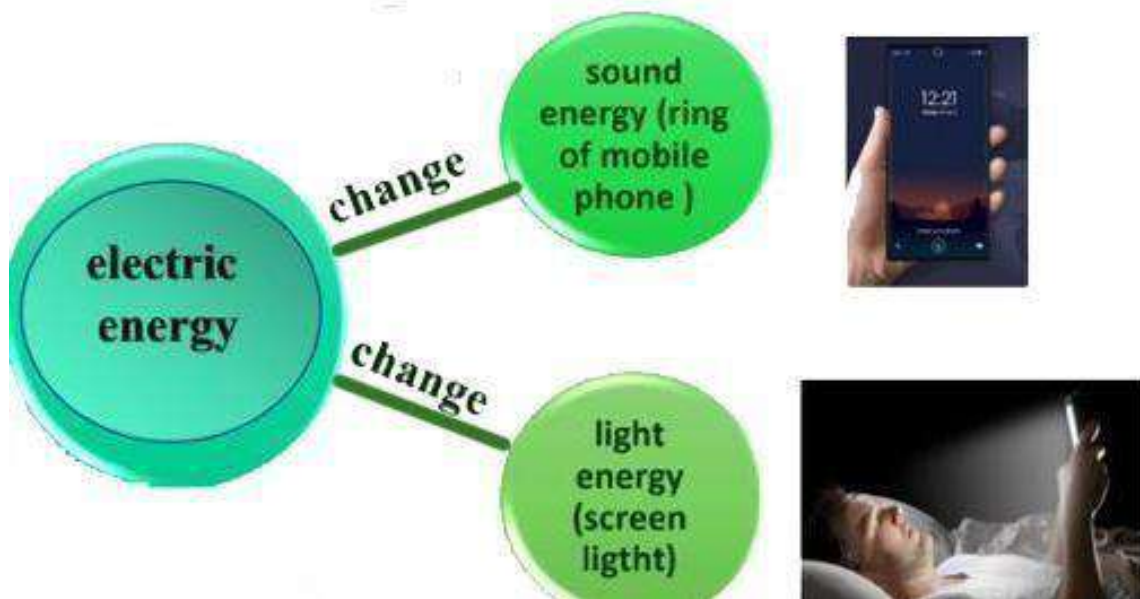
light energy



kinetic energy



Technology help us to convert Light energy comes from the



Activity2 : The energy in car toys operating by remote control.

Some of toys which can be controlled by Remote Control as cars, trucks, planes and ships need energy to be moved and do its functions as turning, move arms and using camera all of these instruments get its energy from electricity.



- **what happens if the charge of battery runs out ?**
 - The remote control will be stopped.
 - we can recharge it by connecting it with Power supply
Or Replacing it with another battery.

- **What is the source of energy in batteries ?**

The electric energy

- **what is the type of energy in batteries?**

Chemical potential energy



- **What is the forms of energy inside the car ?**

Chemical energy in battery change to Kinetic energy, light energy and Sound energy.

Mars exploration rover :

- **How the mars exploration get its energy ?**

- The distance between mars and earth Not less than 54 million km, it takes about 6 months to arrive To mars planet.
- Robots are send to mars to do specific functions as Curiosity Rover
- It need energy for long time Reaches to 6 months or more ... it is difficult to Change its battery or Charge it. due to the long distance

- **How Curiosity Rover can get its energy ?**

Uses solar panels and batteries (which are charged by solar energy) as a resource of energy where :
the vehicle change Solar energy into kinetic, heat, electric energies to operate its sensors to do its functions on mars surfac

Energy & the need of devices to it

Energy makes devices & toys move and do their functions, such as robots in angles, moving their arms or operating her cameras.

- ✦ The source of energy in devices and toys is the chemical energy stored as batteries.

- ✦ When batteries run out, devices stop.

To make a battery work again :

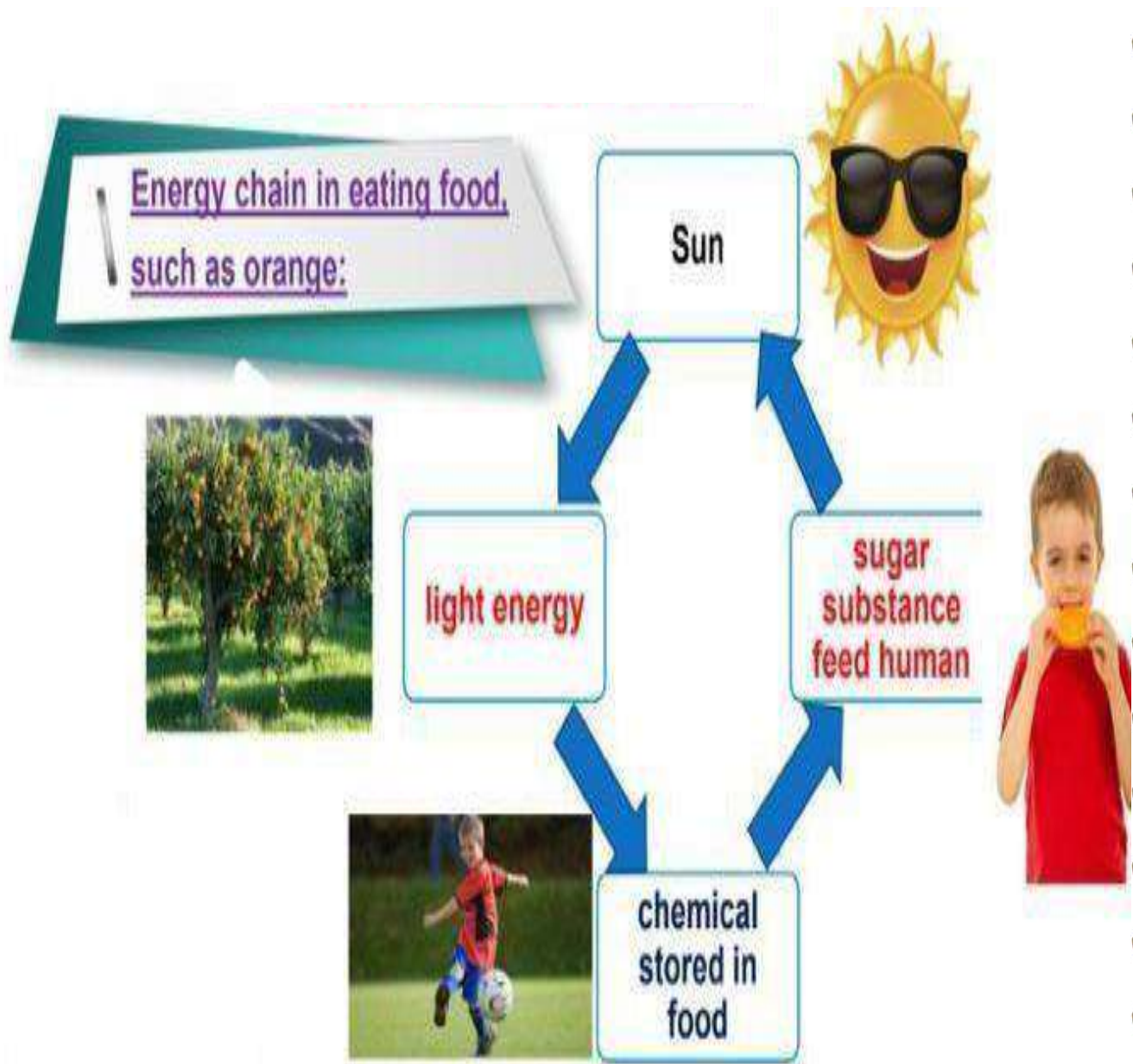
- 1- we charge it.
- 2- we exchange it by a new battery.

Energy Chains

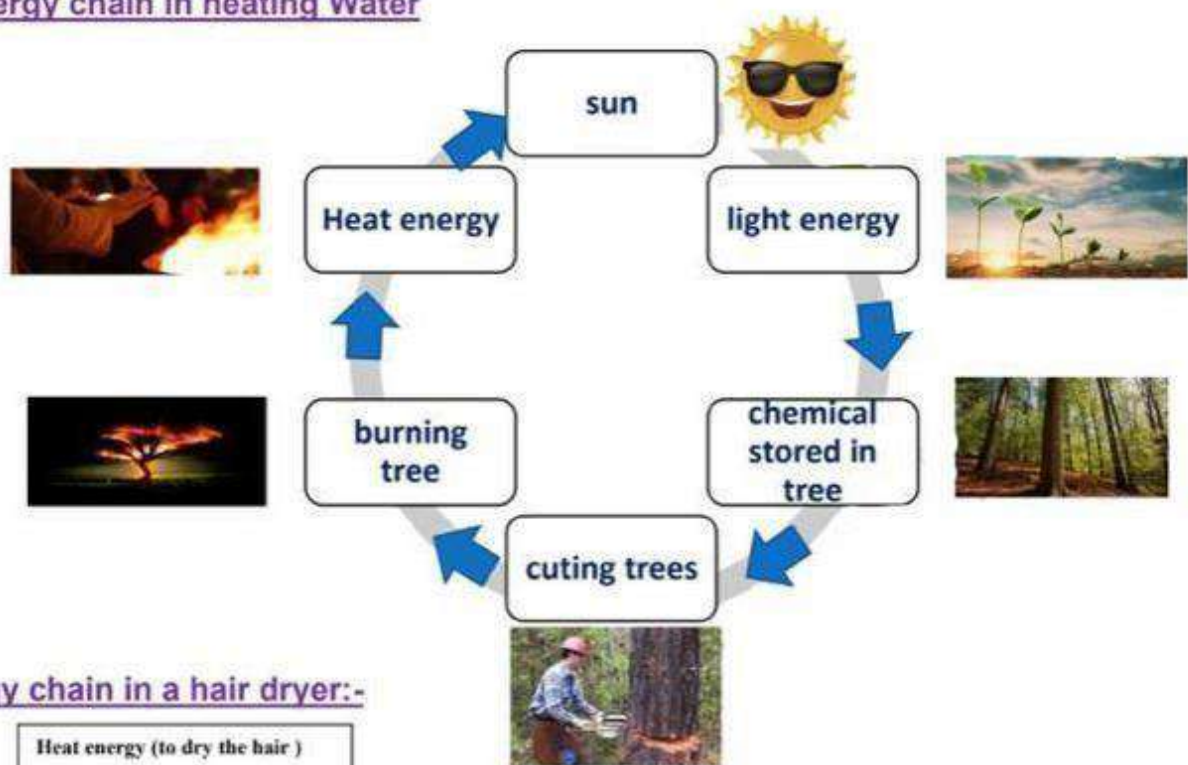
Energy Chains

- Where nuclear energy changes to light energy, which is absorbed by the plants to start the chain.
- The main source of energy is the Sun

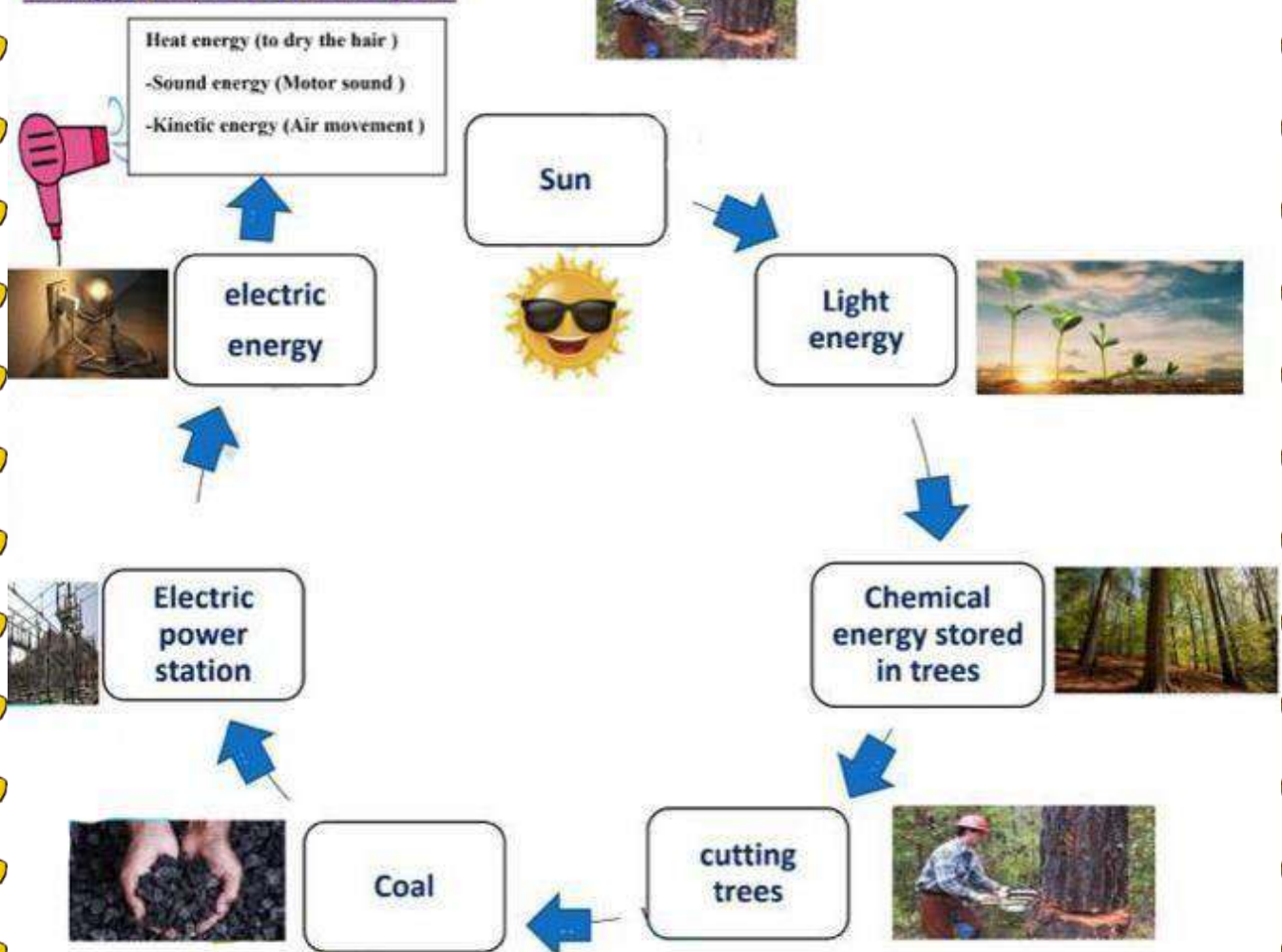
Examples of Energy Chains



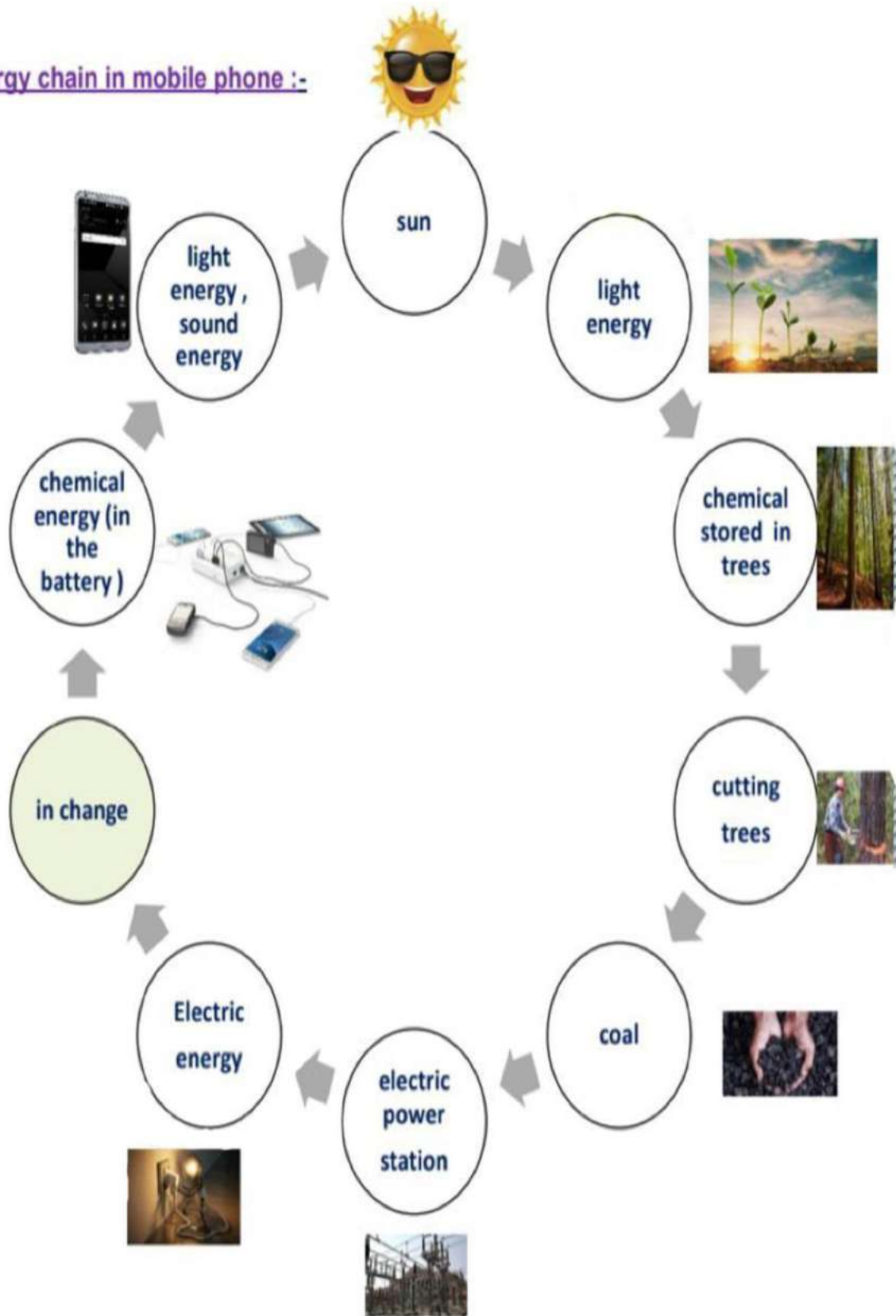
Energy chain in heating Water



Energy chain in a hair dryer:-



Energy chain in mobile phone :-



Energy transformations

Device		Function	Energy input (incoming, used, consumed energy)	Energy output (come out, produced energy)
Hair dryer		Drying hair	Electric	Sound kinetic Heat
Soap dispenser		Dispensing	Potential	Kinetic
Washing machine		Washing clothes	Electric	Kinetic
Electric bulb		Lighting houses	Electric	Light and heat
Motor engine		Moving things	Electric	Kinetic
Dynamo		Obtaining electricity	Kinetic	Electric

Mobile phone		Making calls	Chemical	Sound and light
Bike		transporting	Chemical	Kinetic
Electric iron		Ironing clothes	Electric	Thermal
TV		Transferring sound and image	Electric	Sound and light
Fan		Moving the air	Electric	Kinetic
Small watch		Knowing time	Chemical	Kinetic
Toy car		Toy car for kids	Electric potential	Kinetic
Hand bell		Getting attention	Kinetic	Sound
Electric heater		Warming	Electric	Thermal
Flashlight		Lighting up	Chemical	Light and thermal

From the previous examples, we can conclude that :

Energy can be changed from one form into another, where the new energy cannot be created from nothing, and the old energy does not disappear but it changes from one form of energy into another, this is called "the law of conservation of energy"

The law of conservation of energy :

Energy can neither be created nor destroyed, but only converted from one form of energy into another.

All devices have energy coming in and out of them, where:

- The energy that comes in a device is called "input energy"
- The energy that comes out a device is called "output energy".
- Some of the energy is lost in different forms, while traveling through the energy chain, where most of the lost energy leaks out in the form of heat.

Exercises1

(A) Put (✓) or (×) :

1. The solar vehicle changes sound energy into kinetic energy. ()
2. Mars rover curiosity can be operated from a distance.()
3. The stored energy in batteries is the light energy. ()

(B) Give a reason for the following :

Curiosity robot uses the sunlight and batteries for its operation.

.....
.....

(A) Write the scientific term of each of the following :

1. The main source of energy on the Earth. (.....)
2. The form of energy that is stored in battery of a remote controlling toy car. (.....)

3. The remote controlling vehicle that is used to explore the surface of Mars planet. (.....)

(B) Mention two devices can be operated from a distance by using a remote control.

.....
.....

Look at the opposite figure, then choose the correct answer:

1. This car needs to move.

a. water.

b. wood

c. fuel.

d. energy



2. To keep playing with the toy car when the battery runs out, we have to or recharge the battery.

a. heat.

b. cool

c. replace.

d. freeze

3. The type of energy that is used in operating this car isenergy.

a. sound.

b. light

c. thermal.

d. electrical

Exercises 2

(A) Complete the following sentences:

1. When you rub your hands together, the consumed energy is energy, while the produced energy is energy.
2. The produced energy in a toy car is energies in a hair dryer are energy, while the produced energy and sound energy.
3. The produced energy from coal is energy, that is converted into energy used to operate the machines of electric power stations.

(B) Give a reason for the following :

The thermal energy produced from burning coal is used in some electric power stations.

.....
.....

(A) Put (✓) or (×) :

1. Curiosity robot needs sound energy to be operated. ()
2. The electric lamp is the primary source of most energies on the Earth. ()
3. The electric iron converts electrical energy into thermal energy. ()

(B) What happens if ... ?

You press on the spring of the soap dispenser.

(according to the change of energy).

.....
.....

Look at the opposite figure, then complete the following sentences:

1. This living organism can converts energy of the Sun into energy stored inside it.

2. If the wood of this organism is burned, energy is produced.

3. After death and burying of this organism over millions of years, it becomes coal that stores energy.

4. The formed coal can used in electric power stations to generate energy.



Exercises 3

(A) Choose the correct answer :

1. Mars rover curiosity uses to be operated.

- a. solar energy and electrical energy
- b. solar energy and thermal energy
- c. electrical energy and thermal energy
- d. electrical energy and sound energy

2. While playing a drum, energy changes into energy.

- a. sound - kinetic
- b. sound - light
- c. kinetic - sound
- d. kinetic - light

3. In the bicycle, the kinetic energy is converted into energy due to the friction of its tires with the road.

a. sound.

c. light

b. thermal.

d. chemical

(B) What happens if ... ?

You rub your hands together.

(according to the change of energy).

.....

.....

(A) Correct the underlined words :

1. Energy can neither be created nor destroyed, but only converted from one form to another, this is the law of consuming of energy. ()

2. The consumed energy while burning some pieces of wood is the thermal energy. ()

3. The lighted lamp produces chemical energy that makes you feel warmth when you put your hands near it. ()

(B) Mention two devices that convert electrical energy into both kinetic and sound energy.

.....
.....

Look at the following figures, then complete the following sentences.



Device (1)



Device (2)



Device (3)



Device (4)

1. The electrical energy used to operate devices number and

2. Kinetic energy is produced in devicesand.....

Exercises 4

(A) Complete the following sentences:

1. The output energy of burning coal is energy, which is used to produce energy in electric power stations.
2. The output energy that helps the washing machine to do its main function is energy, and this energy is considered the energy of the hand bell.
3. The input energy of the toy car is energy that is stored in its battery and then converted into..... energy in its wires to operate its motor.

(B) Give a reason for the following :

Sound energy and thermal energy are considered as wasted energy in the washing machine.

.....
.....

(A) Write the scientific term of each of the following:

1. The input energy of a television. (.....)
2. The wasted energy of a computer. (.....)
3. The output energy of the washing machine which helps it to do its main function. (.....)

(B) Mention the input and output energies of the opposite device:



1. Input energy:
2. Output energy :

13 Look at these electric devices, then complete the following sentences :



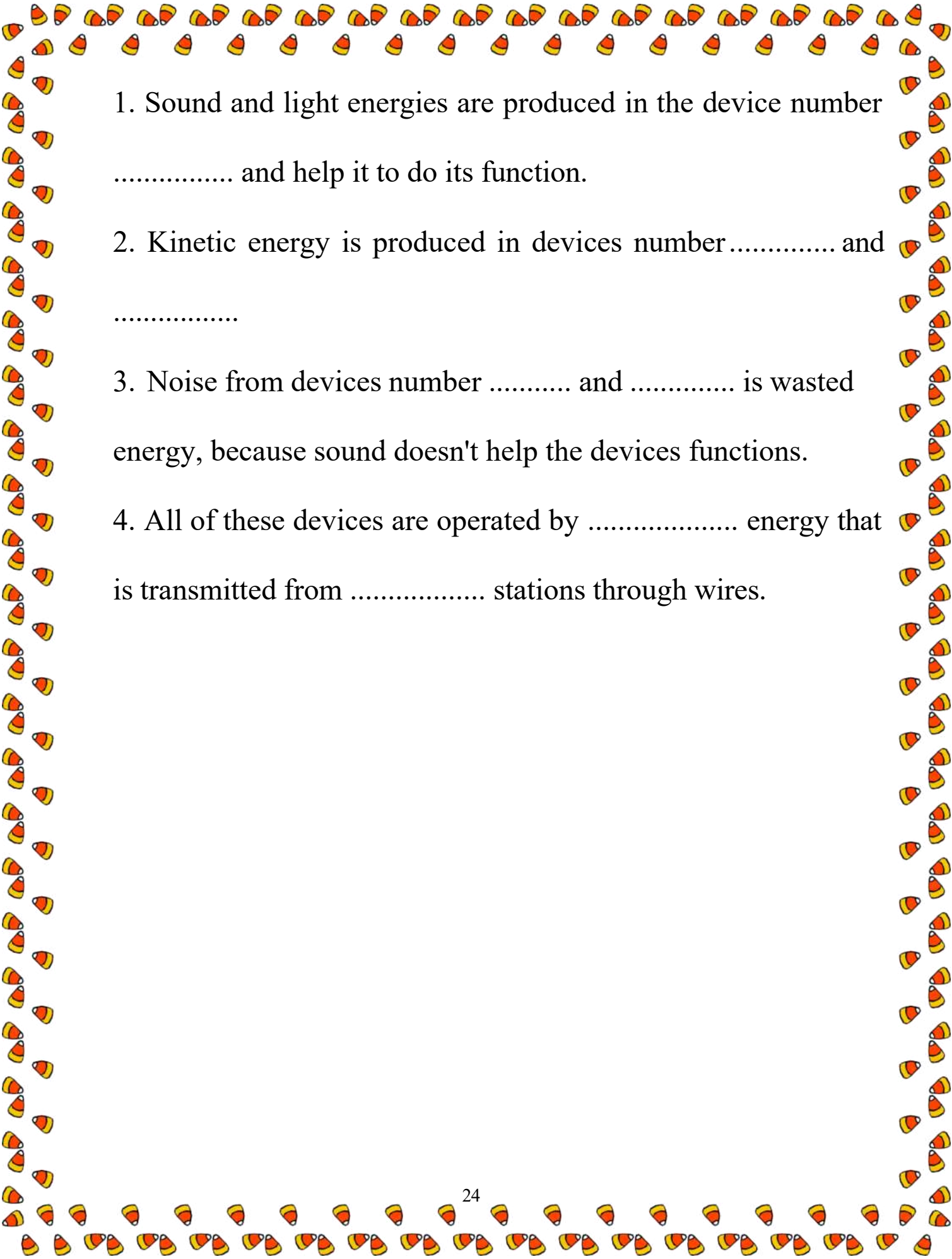
Device (1)



Device (2)



Device (3)

- 
1. Sound and light energies are produced in the device number and help it to do its function.
 2. Kinetic energy is produced in devices number and
 3. Noise from devices number and is wasted energy, because sound doesn't help the devices functions.
 4. All of these devices are operated by energy that is transmitted from stations through wires.

Model Exam

(A) Choose the correct answer:

1. Mars rover curiosity is designed to explore

- a. Earth planet.
- b. Mars planet.
- c. the Sun.
- d. the moon.

2. Plants can convert the light energy from the Sun into energy which is stored inside the plant in the form of sugar.

- a. sound.
- b. electrical
- c. chemical.
- d. kinetic

3. When a piece of coal is burnt, energy is produced.

- a. thermal.
- b. kinetic
- c. sound.
- d. potential

4. Inside a light bulb, electrical energy changes into and energies

- a. sound – light.
- b. sound - thermal
- c. kinetic – light.
- d. light - thermal

(B) What happens if you put your hands near a lighted lamp ?

.....

.....

(A) Put (v) or (x) :

1. There is a stored chemical energy inside the food we eat. ()
2. The input energy in a hair dryer is the chemical energy.()
3. As a result of friction between bike's tire and the road, kinetic energy changes into chemical energy. ()
4. We can convert the solar energy into different forms of energy. ()

(B) Look at the following figures, then complete the following energy chain



Figure (1)



Figure (2)



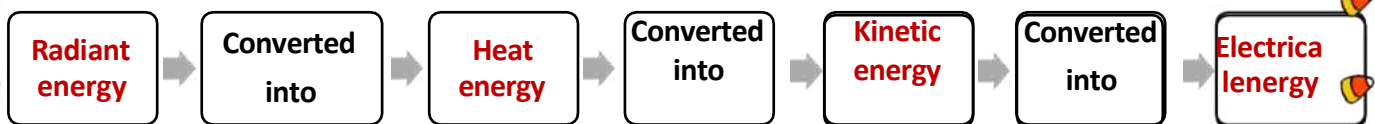
Figure (3)



Figure (4)



Figure (5)



(A) Correct the underlined words :

1. Light energy is stored inside the battery of a mobile phone. (.....)
2. Toy cars depend on fuel as a source of electrical energy. (.....)
3. Light energy, thermal energy and chemical energy are produced when a mobile phone is used. (.....)
4. The solar energy produced from the moon can be converted into different forms of energy. (.....)

(B) Give a reason for the following :

When you press on the spring of soap dispenser, the soap moves upward .

(according to the change of energy)

.....

.....

(A) Write the scientific term of each of the following:

1. The energy that is used to operate a television. (.....)
2. Energy can neither be created nor destroyed, but only converted from one form to another. (.....)
3. A kind of energy that is produced from the electric heater and burning coal. (.....)
4. The energy produced from playing guitar. (.....)

(B) Choose from column (A) what suits it in both columns (B) and (C) :

(A) Energy used	(B) The device	(C) Energy Produced
1. Kinetic energy	a 	A. Thermal energy.
2. Electrical energy	b 	B. Chemical energy.
3. Solar energy	c 	C. Sound energy.

1. → 2. → 3..... ➤

Unit 3 concept 2

Lesson 1

Activity 1 Can You Explain?



Natural gas



Gasoline (oil)

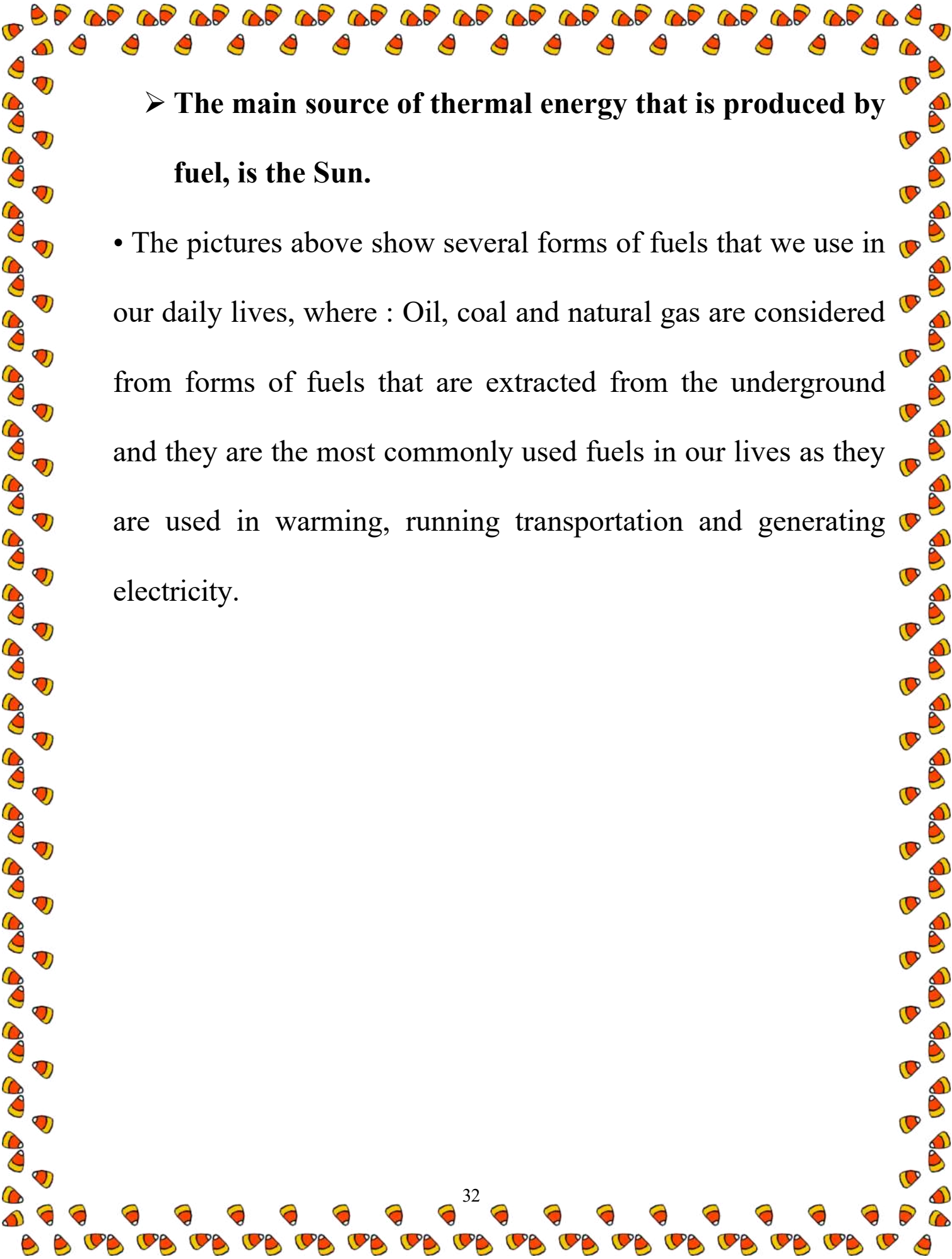


Coal

- Fuel is one of the most important resources of energy that humans depend on to get energy, so where does the fuel we use every day come from?

Fuel :

It is any substance that produces thermal energy when it is burned.



➤ **The main source of thermal energy that is produced by fuel, is the Sun.**

- The pictures above show several forms of fuels that we use in our daily lives, where : Oil, coal and natural gas are considered from forms of fuels that are extracted from the underground and they are the most commonly used fuels in our lives as they are used in warming, running transportation and generating electricity.

Activity 2 Fuels and Road Trips

Yes () No()



- 1. Can cars move on roads when they run out of fuel ?

Yes () No()

- 2. Do cars need fuel to get energy to move ?

- There must be fuel in the car to move again after it stops, where the fuel burns inside the car engine producing thermal energy that is converted into kinetic energy which causes the car to move

Activity 3 What Do You Already know About

Fuels?

► From the previous activities you have learnt that fuel is any substance produces thermal energy when it is burned. Among the several forms of fuel are :

produces thermal energy when it is burned. Among the several



Gasoline (oil)



Natural Gas



Woo



Coal

- Now, we will learn more about different forms of fuel and their uses.

➤ Uses of some different forms of fuel Fuel is used for several purposes, such as :

✓ Cooking food, where coal, natural gas or wood may be used.



✓ Generating electricity, where oil, natural gas or coal may be used.



✓ Warming, where coal or wood may be used used in warming



✓ Operating all means of transportation, where gasoline (oil) or natural gas may be used.



The thermal energy produced from the same form of fuel can be used for different purposes, as shown in the following two energy chains :

The use of coal in cooking :	The use of coal in generating electricity :
Light energy (from the Sun) 	Light energy (from the Sun) 
Chemical energy (stored inside coal) 	Chemical energy (stored inside coal) 
Thermal energy (when burning the coal) 	Thermal and kinetic energies in electric power stations)
	Electrical energy (is transferred through electric wires)

Note : Gasoline is a fuel that is made from petrol oil.

Lesson 2

Activity 4 Types of Fuel

The following pictures show several forms of fuel. Complete the following sentences using the words below pictures (you may use one word more than one time).



1. From forms of fuel that are used in cooking food are.....,.....or.....
2. From forms of fuel that are used in generating electricity are.....or.....
3. From forms of fuel that are used in operating all means of transportation are.....

► In the previous lesson, you have learnt that fuel is one of the most important resources of energy and these resources are divided into:

<u>1- Renewable energy resources</u>	<u>2-Non-renewable energy resources</u>
They are natural resources that can be replaced after a short period of time of use such as: water , solar energy and wind energy	they are natural resources that are used at a rate faster than they can be replaced, such as: coal , natural gas and oil.
Renewable energy resources: Are those that continually renew or replace the part that has been consumed (used), so they will not run out	Non-renewable energy resources Are those that run out when consumed (used), and cannot be renewed in a short period of time

➤ Types of fuel can be classified into:

1-Biofuel

- It is a fuel that is produced from living organisms that can be planted (i.e., plants).
- Biofuel is a renewable energy resource that is continually renewed as plants grow, so it is known as "renewable fuel".
- Its primary source: The Sun Examples:

1. Wood is the oldest fuel that is still used all around the world **in warming** and **cooking food**.



is made from wood and it is one of the most important forms of fuel.



3. Some types of plants such as grass, corn and wood chips can be used to make a liquid fuel.



Conservation of biofuel :

Although biofuel is a renewable energy resource, it should be conserved “rationalized , where :

Using wood as a source of energy requires cutting down trees

Rapid cutting trees (knowing as **deforestation**) causes negative effects on the environment

Therefore ,the wood we use should be continuously **rationalized** so that it will not run out .

Note

Many trees grow a few centimeters each year, while some trees reach their full height in a period nearly equals the human's lifetime. This means that the growth of these trees takes more than one human's lifetime to complete their growth.

2- Fossil fuel

- It is a fuel that is produced from old living organisms (plants or animals) that were buried and decomposed over a long period of time.

- Is a non-renewable energy resource, because once it is consumed, it runs out faster than it can be renewed.
- Its primary source : The Sun Examples:



1. Oil and natural gas are formed when the remains of marine organisms (sea animals) were decomposed.



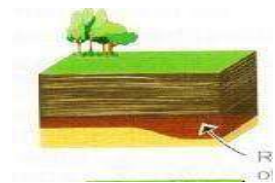
2. Coal is formed when the remains of plants were decomposed.

Formation of coal :

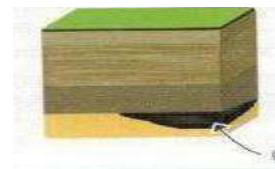
300 million years ago, large areas of the Earth were covered with swamps, with a lot of plants growing nearby.



When those plants died, their remains were decomposed and covered by hundreds of meters of mud and rocks.



Due to the effect of extreme heat and pressure, those remains were turned into coal.



Conservation of fossil fuel :

-Non-renewable fossil fuels should be conserved and alternative resources should be found as :

- Fossil fuels (coal, oil and natural gas) take millions of years to be formed, as they are consumed faster than they are formed.

Once they are used, they start to run out **because they can't be easily renewed.**

- Oil and water are considered from resources that are used by humans to generate energy.
- Oil has a structure differs from that of water.
- Oil is a non-renewable energy resource, while water is a renewable energy resource. Formation of oil :
- Oil is extracted from the underground as a result of decomposition of marine organisms, where :

When those marine organisms died, their remains settle on the ocean floor.

Over millions of years, layers of sediments and rocks cover the remains of those marine organisms, this results in extreme **heat and pressure**.

Over time, as a result of extreme heat and pressure, those remains converted into **oil**

Conservation of oil :

➤ Oil is consumed at a rate greater and faster than the production of new oil, so it should be rationalized in order to avoid running out through many ways such as:

- 1- Reducing the use of private vehicles.
- 2- Using of public means of transportation.



Conservation of water :

- People should use water carefully and rationalize its using through many ways such as:
- 1- Avoid wasting or polluting water, because we may not be able to replace it as quickly as we need.
 - 2- Growing plants that do not need large amounts of water for irrigation.

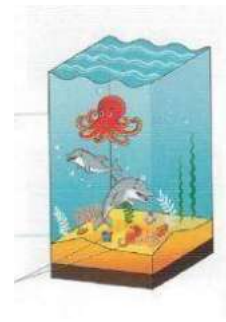


Lesson 3

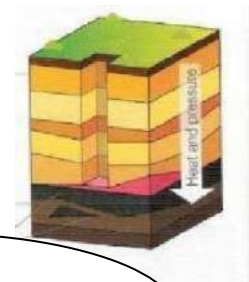
Activity 7 Fossil Fuel Formation

➤ Arrange the following steps to know how the fossil fuel is formed :

The remains of marine living organisms were buried and decomposed under sediments and rocks.



Due to the effect of extreme heat and pressure, the remains of marine living organisms were turned into oil or natural gas.



Oil or natural gas

The death of marine living organisms that have lived since ancient times.



Activity 8 Living Without Electricity

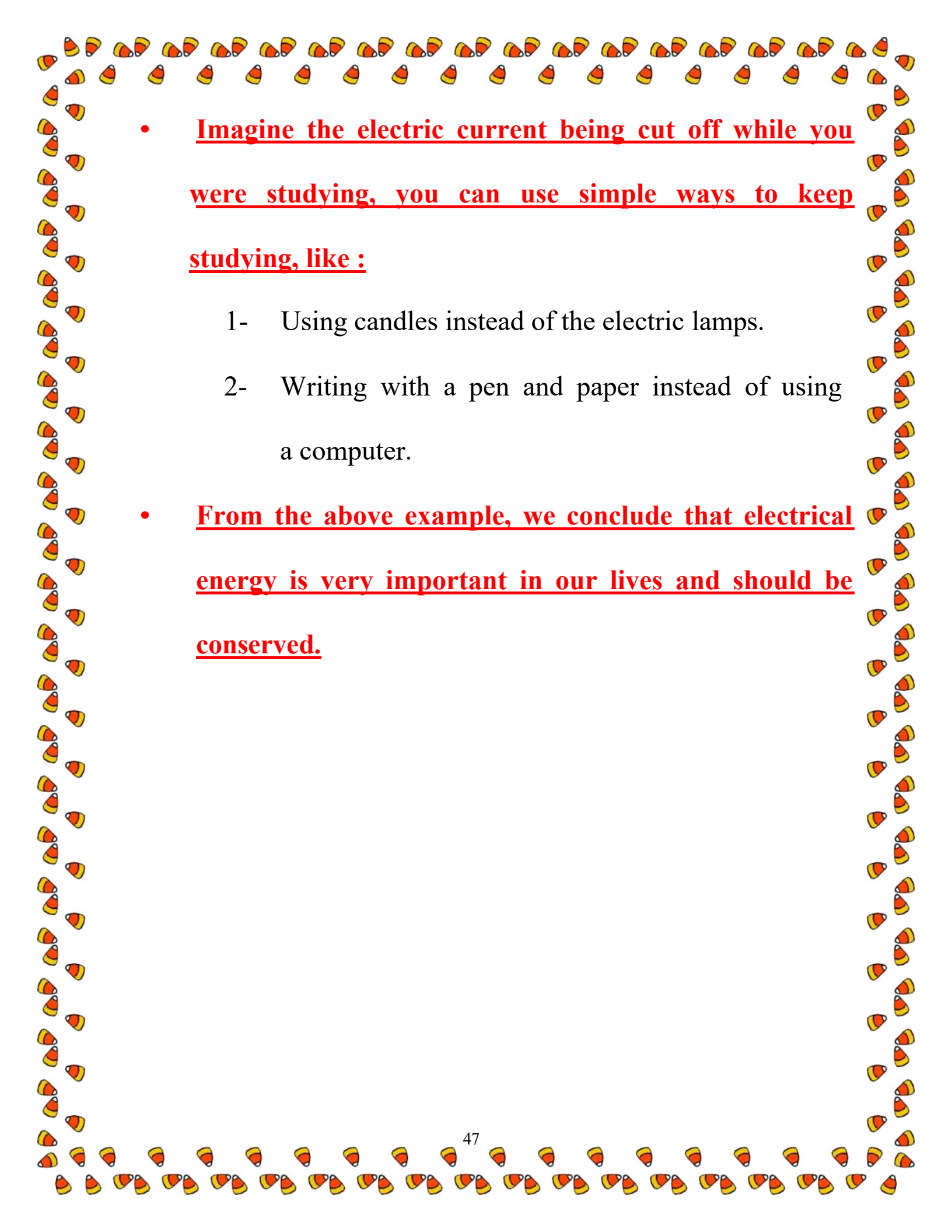
- - fossil fuels are non-renewable energy resources which are used to generate electrical energy, where, natural gas and oil are used to generate electricity in many regions, so they should be conserved.
- -Renewable energy resources such as hydroelectric energy (from waterfalls and dams) and wind energy are also used to generate electricity.
- Whatever the resource of energy is renewable or non-renewable, we should conserve the energy through many ways such as:

1- Turning off lights when they are not needed.



2) Unplugging electrical appliances when not in use.



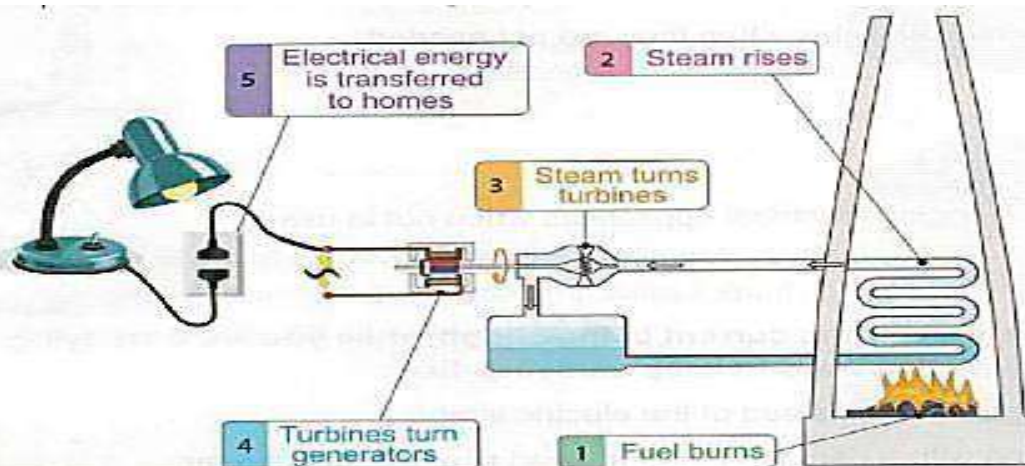
- 
- Imagine the electric current being cut off while you were studying, you can use simple ways to keep studying, like :
 - 1- Using candles instead of the electric lamps.
 - 2- Writing with a pen and paper instead of using a computer.
 - From the above example, we conclude that electrical energy is very important in our lives and should be conserved.

Activity 9 Using Fossil Fuels to Generate Electricity

➤ As you knew from the previous lessons that fossil fuels have many uses including:

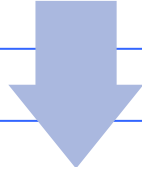
1. The use of gasoline and natural gas to operate cars.
 2. The use of oil, coal and natural gas to generate electricity.
- Now, we will study how fossil fuel can be used to generate electricity, which is used to light homes.

How fossil fuel is used to produce electricity



1- Fuel burns

When fuel burns, it produces thermal energy.



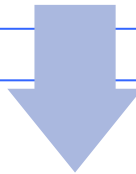
2- Steam rises

This thermal energy is used to heat water producing steam.



3- Steam turns turbines

The steam goes inside tubes to be used to operate devices called turbines.



4- Turbines turn generators

The movement of turbines produces kinetic energy, which is used to operate the generator.

When the generator is turned on, it converts the kinetic energy into electrical energy.



5- Electrical energy is transferred to homes

Finally, the electrical energy is transferred through cables (wires) to homes to operate different devices.

Lesson 4

Activity 10 : Big City Environmental Concerns

➤ Put (✓) in front of the picture that shows environmental pollution .



()



()



()

- From the previous lessons, you have learnt that fossil fuels have negative effects on the environment.
- In this lesson, we will study that fossil fuels have many bad effects in big cities, where the increase of people's needs and their industrial and agricultural activities cause pollution problems around the world.

Some sources of pollution in big cities

**1- Burning fuel produces smog,
which pollutes the air.**



**2- Pesticides used on farms are mixed
with water in canals and rivers when
rain falls, this lead to pollution of soil
and water.**



**3- Using chemicals in factories
pollute the air and also the nearby
water sources and soil.**



Some effects (impacts) of air pollution on human's health

1. Smog from cars cause irritation of human's eyes and lungs.



2. Scientists have found that smog contains tiny particles that the human breathes in, these particles irritate the lungs, causing the damage of tissues of the respiratory system.

Activity 11 Burning Fossil Fuels and Pollution

- In the previous lessons, you have learnt that extracting fossil fuel from the underground harms the environment and when burning this fuel to generate electrical energy, this pollutes the environment.

People need energy to operate trains, cars and ships, and even more energy is needed to supply houses, schools and factories with electricity.

- To get this energy, the solution was to extract and use fossil fuels to generate electrical energy, where :

Coal, oil or natural gas is burned at electric power stations and the energy produced from burning fuel is used to generate electricity.

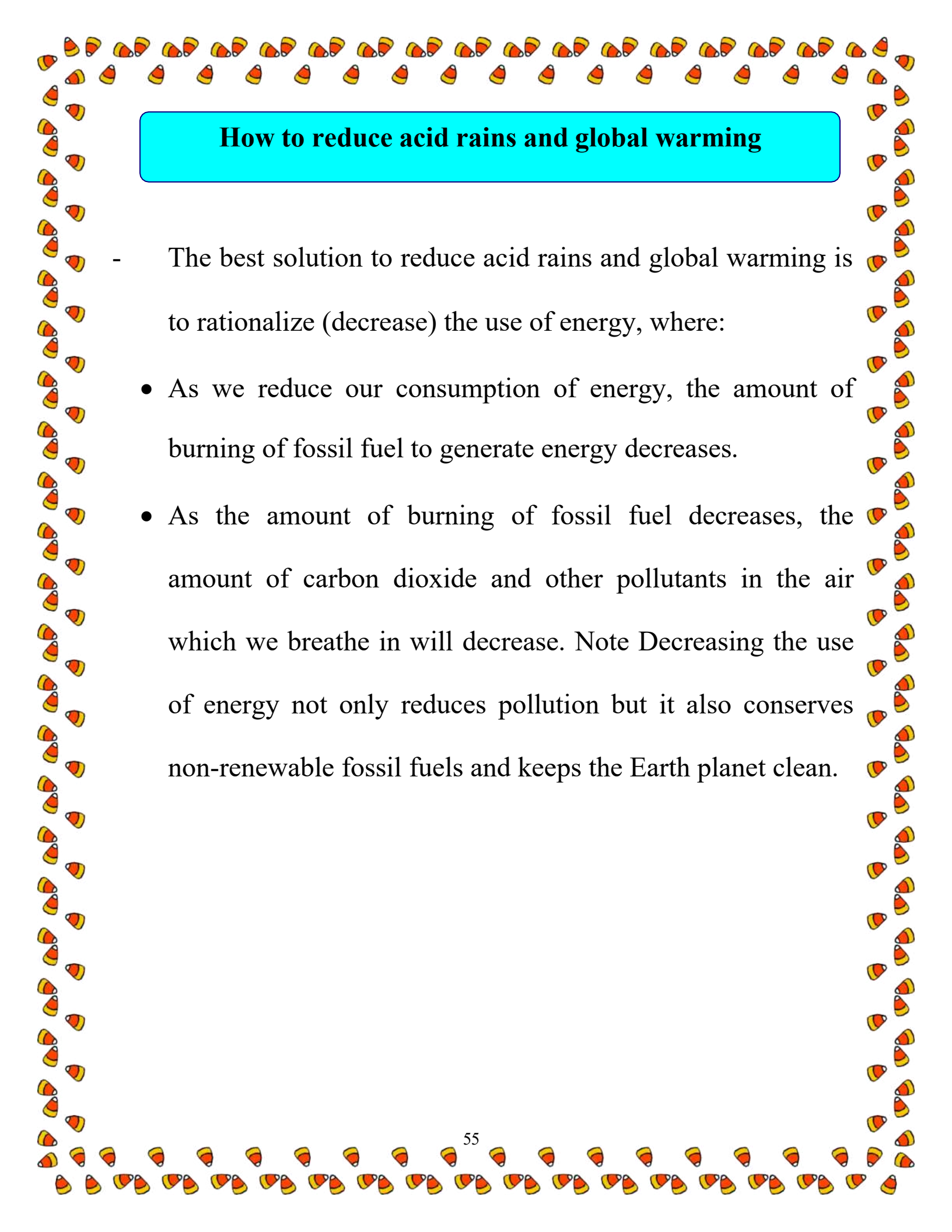


➤ **Then, the generated electricity is transferred to different places through electric wires.**

Harms of burning of fossil fuels on the environment

-Burning fuel not only produces electricity but also pollutes the environment, where burning of coal and oil produces carbon dioxide gas which causes :

1- Acid rains	2-Global warming
Carbon dioxide gas combines with water in the air to form carbon acid ,resulting in acid rains that cause: 1- The death of trees. 2- Decomposition and dissolving of some global warming. rocks includingbricks of buildings. 3- Chemical changes in the structureof lakes causing the death of fish. 4- Chemical changes in the structureof soil	Increasing the amount of carbon dioxide in the air to form carbonic acid, resulting gas in the air forms a layer in the in acid rains that cause : 1-atmosphere that traps heat above the Earth's surface causing a slow rise in the Earth's temperature, which is known as global warming .



How to reduce acid rains and global warming

- The best solution to reduce acid rains and global warming is to rationalize (decrease) the use of energy, where:
 - As we reduce our consumption of energy, the amount of burning of fossil fuel to generate energy decreases.
 - As the amount of burning of fossil fuel decreases, the amount of carbon dioxide and other pollutants in the air which we breathe in will decrease. Note Decreasing the use of energy not only reduces pollution but it also conserves non-renewable fossil fuels and keeps the Earth planet clean.

Lesson 5

Activity 12 Conserving Fossil Fuels

➤ Look at these pictures, then answer:



Is fossil fuel used to cook food?
(yes) (No)



Is fossil fuel used to generate
electricity to light homes ?
(yes) (No)

From the previous lessons, you have learnt that how fossil fuels burn to generate electricity that lights our homes, so we should conserve this type of fuel, where:

- There is a limited amount of fossil fuels available on the Earth.
- Fossil fuels are formed over millions of years, this means what we use cannot be replaced as quickly as it is consumed.
- Fossil fuels are considered non-renewable natural resources of energy that will run out from the Earth if consumption is not rationalized.

Some methods of conserving fossil fuels

- 1- Walking or using bicycles instead of driving a car.



2- Turning off the lights when you are not in the room.



3- Replacing fossil fuels with renewable energy resources such as : solar energy, hydroelectric energy and wind energy.



Disadvantages of using fossil fuels in energy production

- The amount of fossil fuels is limited and could run out.

• **When fossil fuels burn, they emit gases that cause :**

- Air pollution.
- Trap heat in the atmosphere, which raises the temperature of Earth planet and changes its climate. This phenomenon is known as "global warming."

Note :

The use of renewable energy resources instead of fossil fuels means that renewable energy resources will not run out and so this will not cause an increase in Earth's temperature but production of energy by using renewable energy resources is more expensive than using fossil fuels.

Exercises1

(A) Choose the correct answer:

1. To move a car, the fuel must be at first.
 - a. freezed.
 - b. cooled
 - c. burned inside the car engine
 - d. removed from the fuel tank
2. During driving a car for a long distance, which of the following sentences describes the most important thing for the driver?
 - a. The presence of a speedometer.
 - b. The presence of a radio.
 - c. The fuel tank contains enough amount of gasoline.
 - d. The fuel tank contains a little amount of gasoline.

3. On burning fuel we obtain

- a. sound energy.
- c. electrical energy.
- b. potential energy.
- d. thermal energy.

(B) Give a reason for the following :

The importance of wood and coal in our houses.

.....

.....

(A) Put (√) or (×) :

1. Energy that is produced from burning gasoline, cannot be used to move a car. ()
2. Burning of all forms of fuel produces thermal energy. ()
3. If the fuel decreases in a car during driving, the driver must stop at the nearest fuel station to supply the car with gasoline. ()

(B) Mention three different forms of fuel.

.....

.....

Put each of the following words in front of the suitable sentence:

[The Sun - Wood - Gasoline - Thermal energy]

1. It is a form of fuel that is used in different means of transportation. (.....)

2. It is a form of fuel that is used in warming houses. (.....)

3. It is a form of energy which is produced from burning fuel. (.....)

4. The main source of most energies on the Earth's surface. (.....)

Exercises 2

(A) Choose the correct answer:

1. Car engines can be operated by
 - a. coal only.
 - b. coal and wood.
 - c. gasoline only.
 - d. gasoline and natural gas.
2. The fossil fuel are formed under the Earth's surface from dead plants or animals, after a period of time.
 - a. very short
 - b. short
 - c. very long
 - d. long

3. The two main types of fuel are

- a. wood and coal.
- c. the Sun and the moon.
- b. water and wind.
- d. fossil fuel and biofuel.

(B) Give a reason for the following :

Biofuel is considered as a renewable fuel.

.....
.....

(A) Put (✓) or (×) :

- 1. Coal can be used to produce electrical energy. ()
- 2. Coal, gasoline and wood are considered as renewable resources of energy. ()
- 3. The non-renewable resources of energy include coal, gasoline and water. ()

(B) What happens if ... ?

Marine organisms were buried under the Earth's surface over millions of years.

.....
.....

Choose from column (B) what suits it in column (A) :

(A) Form of fuel	(B) We can get it from
1. Wood	a. wood chips and grass.
2. Gasoline and natural gas	b. cutting of trees.
3. Coal	c. decomposition of marine animals.
4. Liquid biofuel	d. decomposition of plant remains.
	e. boiling water.

1. 2. 3. 4.

Exercises 3

(A) Choose the correct answer:

1. To produce steam inside the electric power station, we have to
 - a. cool the water.
 - b. freeze the water.
 - c. heat the water.
 - d. cool the fuel.
2. The devices in the electric power station which operated by steam are
 - a. the generators.
 - b. the turbines.
 - c. the tubes.
 - d. the cables.

3. The generator inside the electric power station, turns

- a. water into steam.
- b. steam into water.
- c. electrical energy into kinetic energy.
- d. kinetic energy into electrical energy.

(B) What happens if..... ?

An electric generator in a power station is damaged.

.....
.....

(A) Put (✓) or (×) :

- 1. The function of turbines in electric power station is similar to that of generators. ()
- 2. Turbines convert kinetic energy into electrical energy.()
- 3. The electrical energy that is produced from electric power station, can be used in houses, streets and factories.()

(B) Complete the following sentences by choosing the correct answer from those between brackets :

1. Fossil fuel are [non-renewable - renewable] resources of energy which are used to generate electrical energy.
2. Turbines in electric power stations are operated by the effect of [steam - sand].
3. Electrical energy travels from electric power stations to houses through [cars - cables].

B From your understanding of how electricity is generated in electric power stations. Put each of the following words in front of its suitable sentence:

[Coal - Steam - Turbine - Generator]

1. Its movement produces kinetic energy. (.....)
2. It changes kinetic energy into electrical energy. (.....)
3. It is a type of non-renewable resources of energy. (.....)
4. It is resulted from heating the water and it turns turbines.
(.....)

Exercises 4

(A) Choose the correct answer:

1. When carbon dioxide gas increases, the Earth's temperature

.....

- a. decreases slowly.
- b. increases slowly.
- c. decreases fastly.
- d. doesn't change.

2. All forms of fossil fuel are formed

- a. above the Earth's surface.
- b. under the Earth's surface.
- c. above the water surface.
- d. in the air around us.

3. We have to protect stones of buildings from

- | | |
|--------------------|------------------------|
| a. global warming. | b. oxygen gas. |
| c. acid rain. | d. carbon dioxide gas. |

(B) Give a reason for the following :

Burning of coal and oil causes the increase of the Earth's temperature.

.....

.....

(A) Put (✓) or (×) :

1. Acid rain causes global warming. ()
2. Mixing of water with oxygen gas produces carbonic acid. ()
3. Acid rains have negative effects on both soil and water of canals. ()

(B) What happens if..... ?

Some people live in a city that has too much cars smog.

(according to the human health).

.....

.....

Scientists do some experiments to know the bad effects of some different sources of pollutions on different living organisms.

Match each experiment with its correct observation :

The experiment	The observation
1. Exposing a dog to cars smog for a few minutes	a. its leaves turn brown and it will die.
2. Placing a building stone in a cup contains a sample of acid rain for a long period of time	b. irritation of its eyes and lungs.
3. Watering a small plant with acid rain for a week	c. it -will decompose into small rocky particles.

1.2. 3.....

Exercises 5

(A) Choose the correct answer:

1. The energy that originally causes the formation of the non-renewable fuels is
 - a. wind energy.
 - b. water energy.
 - c. solar energy.
 - d. electrical energy.
2. As the time passes, the amount of coal will
 - a. increase.
 - b. decrease.
 - c. remain constant.
 - d. increase then decrease.
3. Burning of fossil fuel produce.....
 - a. only gases that pollute the air.
 - b. only thermal energy.
 - c. gases that pollute the air and solar energy.
 - d. thermal energy and gases that pollute the air.

(B) Give a reason for the following :

Burning fossil fuel causes global warming phenomenon.

.....

.....

(A) Put (✓) or (×) :

1. Renewable forms of fuel can be replaced faster than non-renewable forms of fuel. ()

2. Burning fossil fuel produces gases that don't cause global warming. ()

3. Burning coal emits gases which cause air pollution. ()

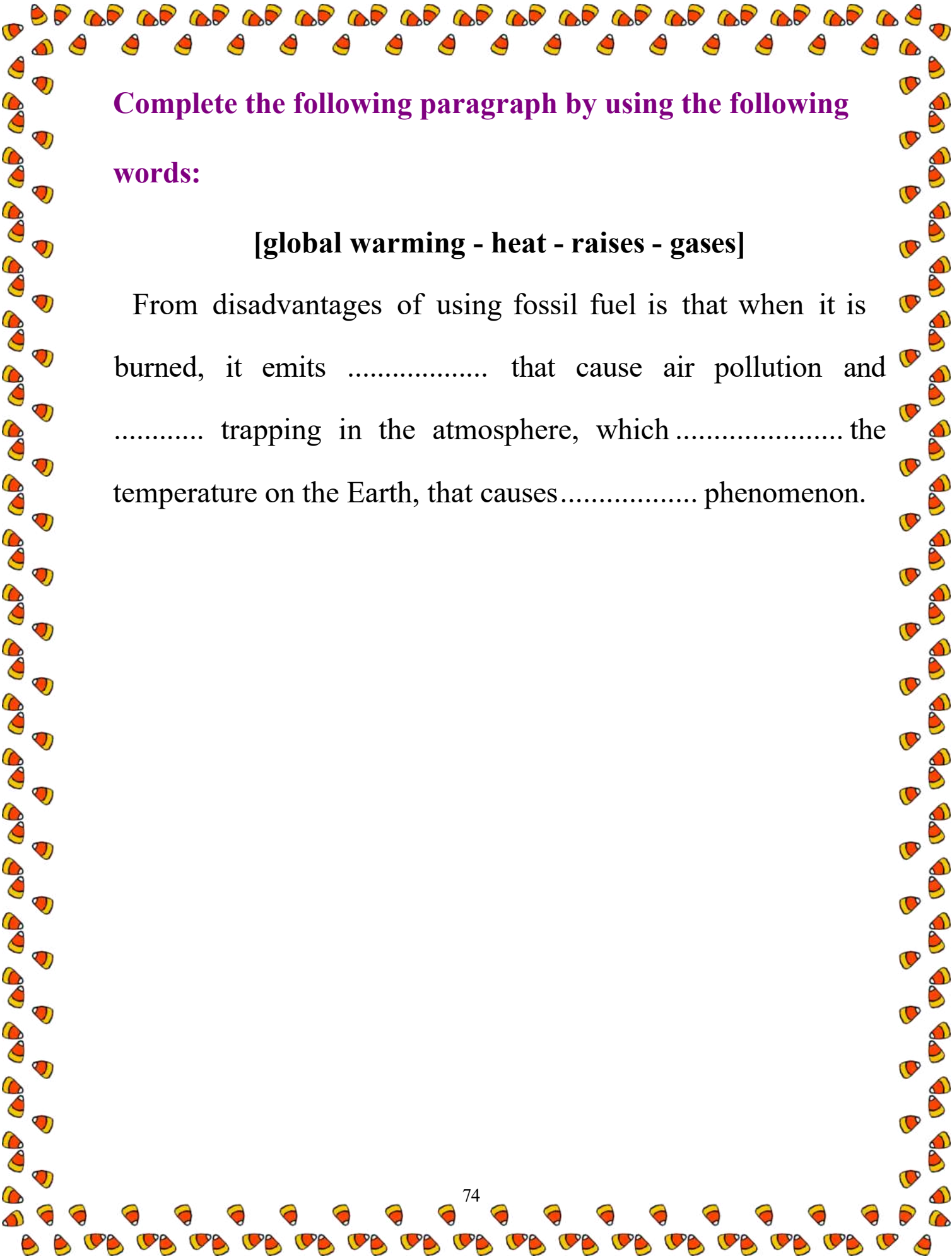
(B) What happens if ...?

The amount of gases produced from burning of fossil fuel increases to very high limit.

(according to Earth's temperature)

.....

.....



Complete the following paragraph by using the following words:

[global warming - heat - raises - gases]

From disadvantages of using fossil fuel is that when it is burned, it emits that cause air pollution and trapping in the atmosphere, which the temperature on the Earth, that causes phenomenon.

Model Exam

(A) Complete the following sentences:

1. Some forms of fuel can be used in cooking such as and
2. The electric generator changes energy into energy.
3. Using the resources of energy is more expensive than using fossil fuel.
4. Different forms of fuel can be classified into two main types which are and

(B) Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Water	a. it needs extreme heat and pressure to be form
2. Wind energy	from remains of dead plants.
3. Coal	b. it is the main resource of energy on the Ear surface. c. it is a gaseous renewable resource of energy. d. it is a liquid renewable resource of energy.

1. 2. 3.

(A) Correct the underlined words :

1. Fuel is the matter that produces electrical energy on burning. (.....)
2. Wood is a form of fossil fuel, that can be used in houses. (.....)
3. Hydroelectrical energy, is used to produce water from waterfalls and dams. (.....)
4. Gases emitted from burning fossil fuel always clear the air. (.....)

(B) What happens if.... ?

We use renewable resources of energy instead of fossil fuel
(according to Earth's temperature)

.....
.....

(A) Put (✓) or (×) :

1. Wind energy will run out faster than natural gas. ()
2. Turning off lights that we do not need, is a way to conserve electricity. ()

3. We can make liquid biofuel from wood chips and grass.()

4. As the speed of the car increases, the amount of used fuel decreases. ()

(B) Arrange the following steps to show how electricity is generated in electric power station and sending it to houses and factories:

(.....) Steam turns turbines that produce kinetic energy.

(.....) Fuel burns and produces thermal energy.

(.....) Electrical energy sent to houses and factories.

(.....) Water becomes hot and produces steam.

(.....) Turbines turn generator that produces electrical energy.

(A) Choose the correct answer :

1. Coal is formed under the Earth's surface from the remains of.....

a. dead animals.

b. dead plants.

c. dead humans.

d. dead insects.

2. Among the following resources, we must conserve

- a. solar energy and coal.
- b. solar energy and wind energy.
- c. wind energy and oil.
- d. oil and coal.

3. All the following are found deeply under the Earth's surface, except

- | | |
|------------------|----------|
| a. natural gas. | b. coal. |
| c. green plants. | d. oil. |

4. All the following are used to generate electrical energy, except

- | | |
|----------------|-----------------|
| a. oil. | b. natural gas. |
| c. waterfalls. | d. rain water. |

Give a reason for the following :

Cutting trees to obtain wood has negative effects on the environment.

.....
.....

Unit 3 concept 3

Lesson1

Activity 1 Can You Explain?

Solar panels



Wind mill



Water mill



What are the various methods for generating electricity from renewable energy resources?

1- From the previous pictures, we notice that the examples of renewable energy resources include:

-Solar energy (sunlight),

-wind energy.

-watermill energy

- Electricity can be generated using the previous renewable energy resources in different ways, where :
 - Solar panels use solar energy to generate electricity which is used to light streets.
 - Windmill turbines generate electricity by using the kinetic energy of wind.
 - Watermill turbines generate electricity by using the kinetic energy of water.

► In this concept, we will study:

- **Windmills and watermills.**
- **Renewable energy resources.**
- **The Sun and the use of solar energy.**
- **Ways to generate useful energy using the wind movement.**
- **Ways to generate electricity using the kinetic energy of water. Notes for parents.**



Activity 2 Windmills and Watermills



Put (✓) in front of the device that is operated with electricity :

• Manual mixer ()

• Electric mixer. ()

- You know that most of the devices around us need electricity to be operated, but how did humans use devices hundreds of years ago before electricity?

Windmills and watermills

- Hundreds of years ago, people needed machines to make their lives easier, for example, they used windmills and watermills which helped them to grind grain to make flour.

- The following table shows the energy used in windmills and watermills as well as the advantages and disadvantages of each :

<u>Points of comparison</u>	<u>Windmills</u>	<u>Watermills</u>
Energy used:	The wind movement generates kinetic energy which moves the mill's blades, then kinetic energy goes to other parts of the mill to grind the grain.	The water movement generates kinetic energy which moves the mill's blades, then kinetic energy goes to other parts of the mill to grind the grain.
Advantages :	• Low cost. • Renewable energy resource	• Low cost. • Renewable energy resource.
Disadvantages:	Sometimes the wind does not blow and the windmills do not move, so they are unable to do their job.	The water supply may dry up and the watermills do not move, so they are unable to do their job.

Note:

Modern wind turbines and old windmills vary in shape and number of blades, but both are used to generate electricity.



Activity 3 What Do You Already Know

About Renewable Energy Resources?

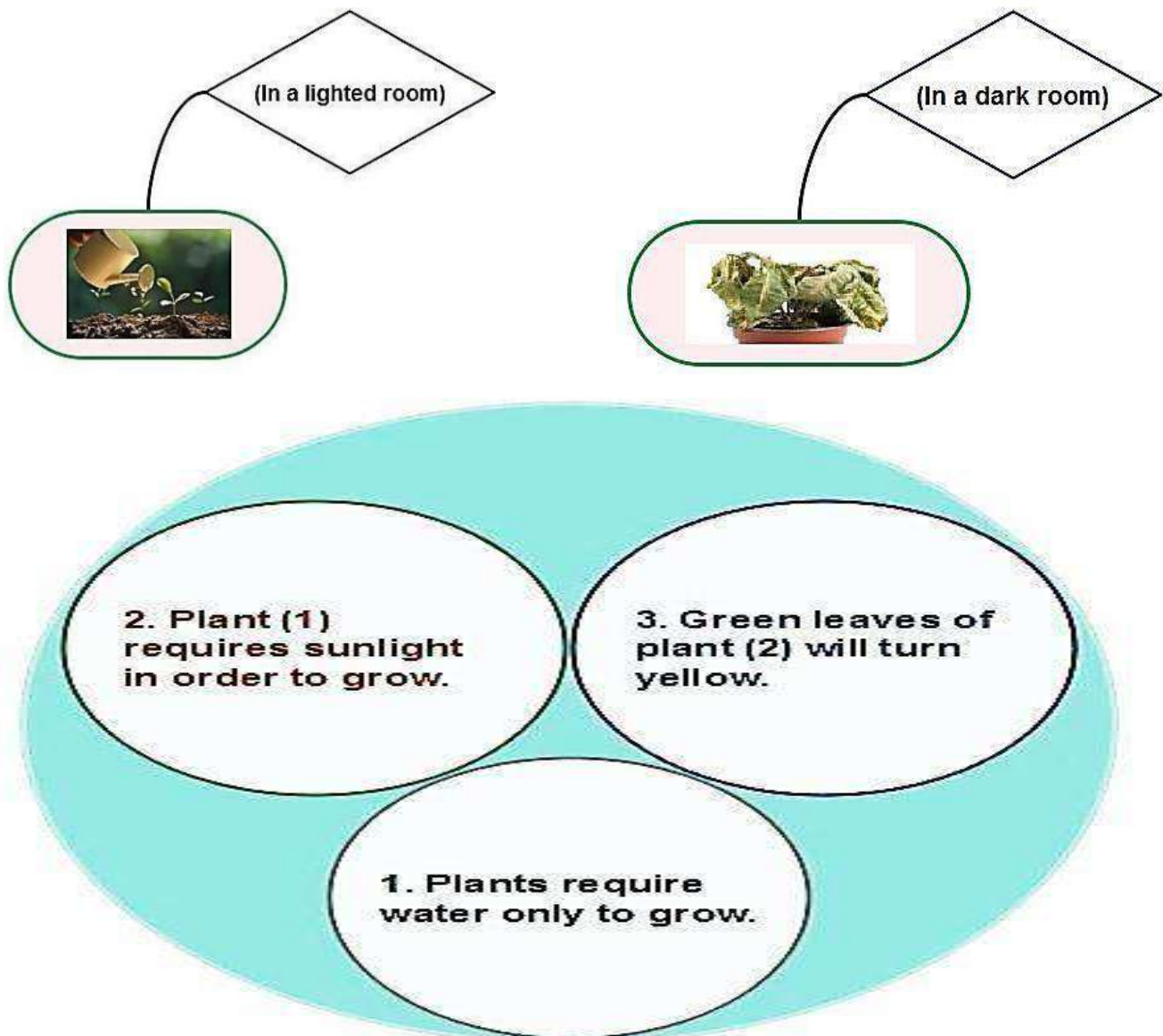
- You have known that any device we use needs energy to be operated.
- The following table shows examples of renewable and non-renewable energy resources :

<u>Energy resource</u>	Renewable or Non-renewable	Example
Battery	Non-renewable	Flashlight 
Gasoline	Non-renewable	Car engine 
Solar panels (sunlight)	Renewable	Lighting lamps
Coal used in electric power Station	Non-renewable	Fan 
Natural gas	Non-renewable	Stove 

Lesson 2

Activity 4 The Sun

-Look at the following pictures, then put (✓) or (×):



- the Sun is important to keep life on Earth.
- The Sun provides us with light and heat.
- Plants need sunlight to grow and without the Sun, plants would not be able to
- survive, so they will die and the animals that eat them will die, too, so life on Earth will disappear.



Sun

- 1- Sun is the star made up of gases hydrogen and
- 2- Sun doesn't have a hard surface like the moon , but it has surface known as photosphere
- 3- The photosphere is a gas layer at sun surface where the light we see emitted.

How does the Sun produce light and heat ?

- The energy of the Sun comes when hydrogen and helium gases in the Sun react at very high temperatures, producing huge amounts of light and heat.
- Light and heat travel through space in the form of waves, some of these waves reach the Earth.

Note:

Do not look directly at the Sun as its rays are too strong and can harm your eyes.



Activity 5 Using Energy From the Sun

- In the previous activity, you have learnt how the Sun is important to living organisms, as most plants and animals need the Sun to survive.
- Now, let's know how the energy of the Sun reaches us on Earth and how we use it in our daily life.
- At night when the Sun is not visible in the sky, you can feel warm because :
 - 1- The atmosphere absorbs the energy of the Sun.
 - 2- Land and water on Earth's surface absorb the energy of the Sun, which causes a rise in the Earth's temperature.

➤ Solar energy

- The energy comes from the Sun is called "solar energy", which is radiant light and heat from the Sun.
- The solar energy that is produced by the Sun contains a type of energy called "radiant energy" (radiation) which is found in the Sun rays.

Uses of solar energy

Direct source of thermal energy

Solar energy can be used directly as a source of thermal energy when exposing yourself to the Sun to feel warm



In greenhouses

Where, greenhouses allow the entry of solar energy (especially radiant energy) that comes from the Sun, then this radiant energy is converted into thermal energy that warms the inside of the greenhouses, which helps farmers to plant the crops that only grow in warm climates



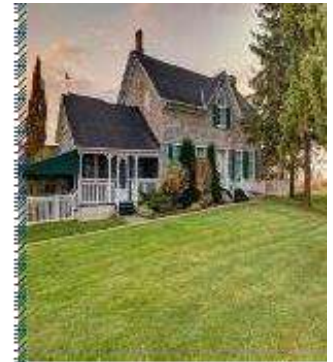
In heating water

Where, panels made of black pipes can be placed on the roof of houses to heat the water when it passes through these pipes, then the heated water is stored in a water tank to be used later.



In warming houses

Where, houses can be built in a way that enables the energy of the Sun to warm them by placing large windows on the walls that face the Sun for most of the day.



In cooking food

Where, curved mirrors are used to collect and focus Sun rays to heat metal pots and cook the food inside.



Activity 6 Solar Energy

- how solar panels convert solar energy coming from the Sun.

Solar panels

- Solar panels can be very small that they can supply only one light bulb with energy, or very large that they can supply buildings or cities with energy.

-How do solar panels work?

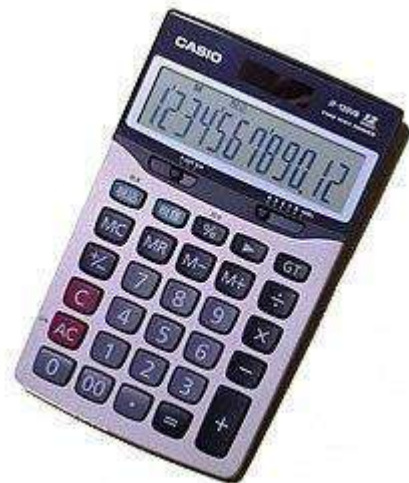


Solar panels

- Solar panels are composed of many small solar cells.
 - These cells capture solar energy (especially radiant energy) coming from the Sun and convert it directly into electrical energy or thermal energy.
- Most solar panels are used to generate electricity.

➤ Uses of electricity generated by solar panels

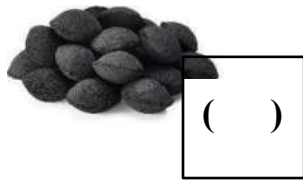
- This electricity can be used directly to light the streets.
- This electricity is used to recharge some types
- of batteries, like some calculators with small solar cells.
- This electricity is used in houses to operate various electric devices.



Lesson 3

Activity 7 Harness the Wind

➤ -Put (✓) next to the renewable energies :



Coal



Water



Wind



The sun

Note:

let's know how wind turbines convert kinetic energy of the
wind into electricity.

➤ -Using energy of the wind

Different amounts of solar energy (especially radiant energy) reach different regions of the world.

Radiant energy causes the air around the globe to heat up to different degrees, where the difference in temperature between cold and hot air causes air to move and wind to blow.



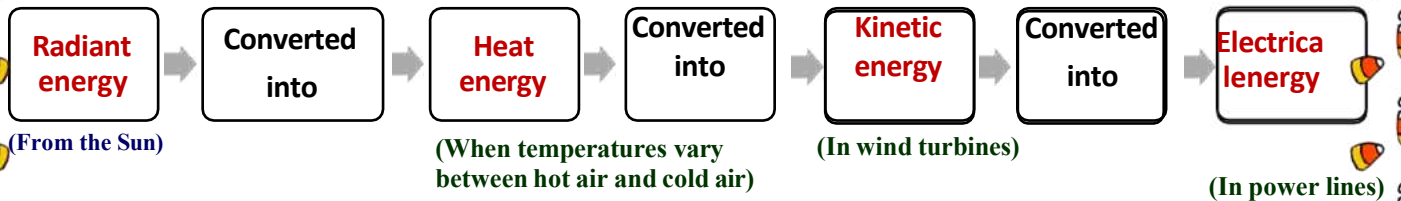
Kinetic energy of the wind movement is used to rotate the blades of windmills.



When the windmill blades rotate, this causes wind turbines inside the windmill to rotate, generating electrical energy that is transmitted through huge wires in power lines to different places such as houses and factories.



➤ The following diagram shows the energy chain of the wind turbines :



Note:

• In water turbines :

-When the number of blades decreases, they rotate faster, so the efficiency of wind turbine increases.

-When the kinetic energy of wind increases, the blades rotate faster, so the efficiency of wind turbine increases.

-When the wind blows from the side of wind turbine, the blades rotate faster, so the efficiency of wind turbine increases.

When the wind blows from the front of wind turbine, the blades rotate slower, so the efficiency of wind turbine decreases

Lesson 4

Activity 9 Falling Water



➤ Look at the following pictures, then put (✓) or (×):

Turbine (1)

Turbine (2)

- Turbines (1) and (2) are used to generate electricity. ()
- Turbine (2) uses the kinetic energy of water to generate electricity. ()
- Turbine (1) is used in places, where there are strong winds to generate electricity. ()

➤ You have known that wind can be used to generate Electricity.

- Now, we will study how water can be used to generate electricity.
- Rivers flow downhill and during this process the gravitational potential energy of water is converted into kinetic energy that helps rotate water turbines to generate electricity.
- Dams are built on rivers to control the water flow and increase the potential energy of water to generate electricity.

Falling water

How can electricity be generated from dams using water turbines ?

The flow of water can be controlled to generate electricity, as the dam prevents the flow of water, so the potential energy of water increases.

When water is released, it flows through water turbines in dams.

The flow of falling water helps water turbines rotate and generate electricity.

This electricity is sent through long electric wires to the places where it is needed, and this type of electricity is called "hydroelectric energy" or "hydroelectricity".



➤ **Hydroelectric energy (hydroelectricity):**

It is a type of electrical energy generated by water turbines in dams.

-The following table shows the similarities and differences between the use of water and the use of wind to generate electricity :

The use of water to generate electricity		The use of wind to generate electricity	
Water is used in places wheredams are built on rivers.	- Differences	Wind is used in places with strong winds.	
- Both are renewable energy resources. - Both of them operate turbines.	Similarities	- Both of them use kinetic energy. - Both of them generate electricity.	

Lesson 4

Activity 10 Modeling a Turbine Generator

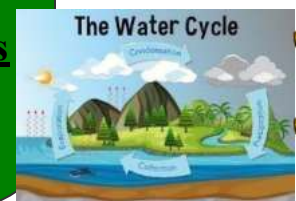
- The blades rotate when water is poured over them and stop when the water inside the jug is completely run out.
- When the water in the jug runs out, refill it with water from the bowl and pour water over the blades again.
- Water is a renewable energy resource.
- The kinetic energy of moving water in rivers is used to rotate water turbines to generate hydroelectric energy.

Note:

In the previous activity, the water used to rotate the blades was not run out but renewed by filling the jug again, which simulates what is happening on the Earth, where :

The river's water does not return back to its source on its way through the dam but it flows into other bodies of water, evaporates then condenses into clouds.

: When rain falls from these clouds, the water returns again to the river, and this is called the water cycle.



Exercises 1

(A) Choose the correct answer:

1. The solar panels use solar energy to generate energy that is used to light up lamps of light posts.

a. thermal

b. kinetic

c. electrical

d. light

2. All the following are considered as non-renewable energy resources except

a. coal.

b. watermills.

c. natural gas.

d. petroleum.

3. Windmill turbines generate electricity that can be used to operate all the following devices except

a. television.

c. hair dryer.

b. blender.

d. hand bell.

Give a reason for the following :

Modern watermills contain turbines.

.....

.....

(A) Put (✓) or (×) :

1. Electricity that is produced from watermill turbines is considered as non-renewable energy resource. ()
2. Some toy cars are operated by batteries that are considered as renewable energy resource. ()
3. Hundreds of years ago, people used windmills to grind grain to make flour. ()

What happens if ...?

The water supply that surrounds some modern watermills dries up.

.....

.....

Look at the figure, then complete the following sentences:

1. Device number (1) represents a
..... which depends on the energy
produced from the



2. The energy used to operate a device
number 1 is considered a energy resource.

3. Device number (2) produces..... energy and..... energy.

Exercises 2

(A) Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Windmills	a. generate electricity by using the kinetic energy
2. Solar panels	running water.
3. Watermills	b. generate electricity by using sound energy.
	c. generate electricity by using solar energy.
	d. generate electricity by using the kinetic energy
	moving air.

1. 2 3

(B) Give a reason for the following :

You shouldn't look directly at the Sun.

.....

.....

(A) Correct the underlined words :

1. The stove uses natural gas which is considered as a renewable energy resource. (.....)
2. We can use straight mirrors to direct sunlight onto metal pots to heat them for cooking. (.....)
3. Windmill turbines convert kinetic energy into light energy. (.....)

(B) What happens if.... ?

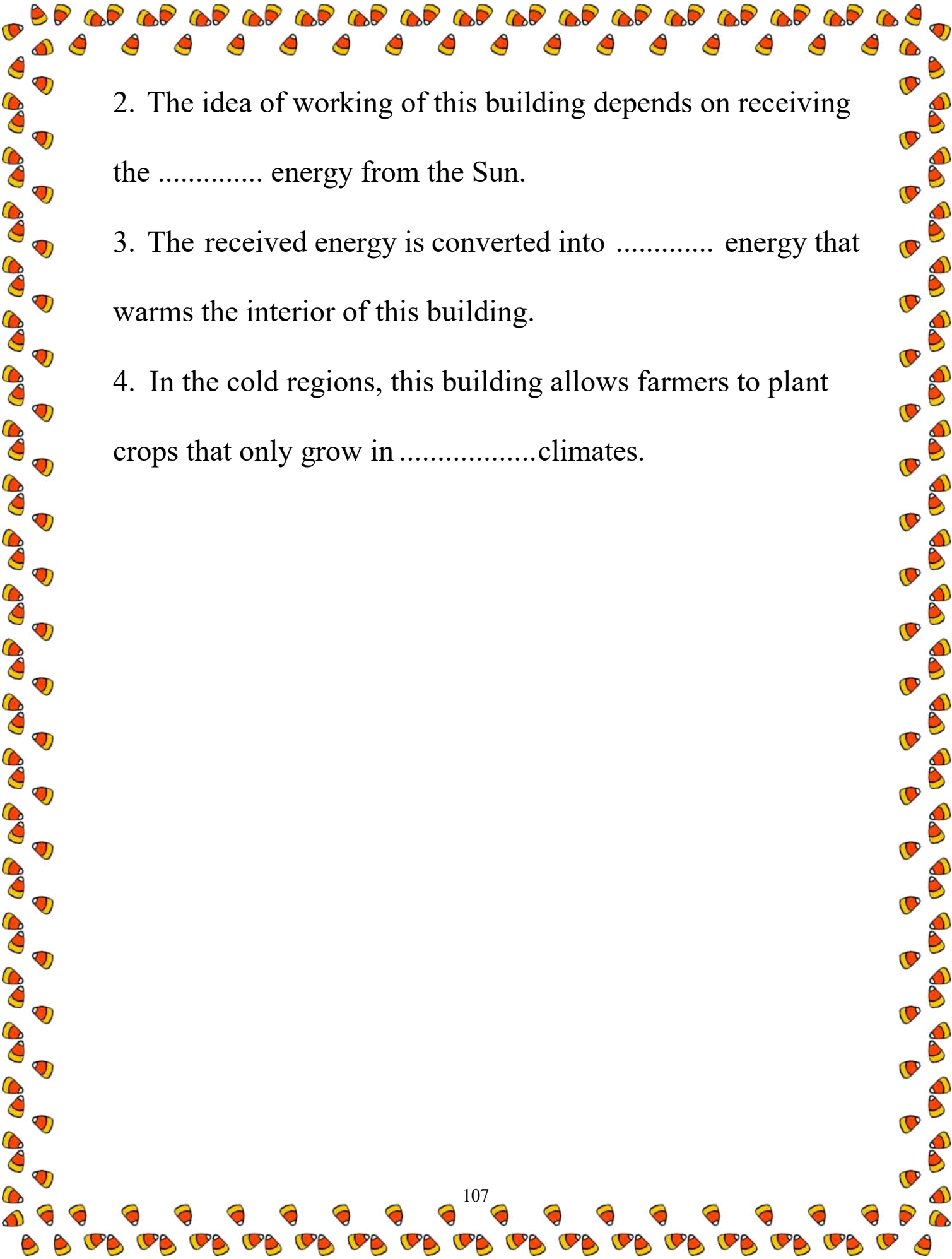
Radiant energy that comes out of the Sun enters the greenhouses.

.....
.....

Look at the opposite picture, then complete the following sentences:

1. The name of this glass building is.....





2. The idea of working of this building depends on receiving the energy from the Sun.

3. The received energy is converted into energy that warms the interior of this building.

4. In the cold regions, this building allows farmers to plant crops that only grow inclimates.

Exercises 3

(A) Complete the following sentences:

1. Radiant energy is used to generate electricity directly by using, or indirectly as it causes blowing that is used to rotate windmills.
2. A windmill spins faster by decreasing the number of its
3. The energy that is produced from modern wind turbines and old windmills is considered as energy resource.

(B) Give a reason for :

Farmers use greenhouses to plant crops that grow in warm climates.

.....

.....

(A) Put (✓) or (×) :

1. Solar panels are used to generate sound energy in light posts. ()

2. When the kinetic energy that is applied to the wind turbines increases, they produce more electricity. ()

3. Both solar panels and natural gas are from renewable energy resources. ()

What happens if ... ?

The number of windmill blades increases.

.....
.....

If the two windmills in front of you are affected by the same wind force.

Answer the following questions :



Windmill (A)



Windmill (B)

1. Which windmill spins faster? (Give a reason for your answer).

.....

.....

2. Which windmill generates less electrical energy?

.....

.....

Exercises 4

(A) Choose the correct answer:

1. When the wind turbine rotates, the energy of moving air changes intoenergy.

a. electrical

b. light

c. chemical

d. potential

2. All the following can be done by the effect of solar energy except.....

a. warming houses.

b. cooking food.

c. producing sound from a hand bell

d. producing light from a light post.

3. Water turbines can generate more electricity by increasing the energy of water that is stored in dams.

a. light

b. sound

c. thermal

d. potential

(B) Give a reason for the following :

Water turbines are used to generate electricity in dams.

.....

.....

(A) write the scientific term of each of the following:

1. A building that is built across rivers to control the water flow and increase its potential energy. (.....)

2. A building that is used in cold areas to plant crops which grow in warm climate. (.....)

3. An energy that is produced from water turbines and is transmitted through wires to operate different devices in houses. (.....)

B) Mention two devices use solar energy to be operated then mention the energy transformation in each one of them.

1. Device (1) :.....

Changes of energy :.....

2. Device (2) :.....

Changes of energy :.....

Look at this picture that shows the High Dam that was built in Aswan many years ago, then put (✓) or (×) in front of the following questions:



1. Stored water behind this dam has potential energy. ()

2. The flow of water through this dam can be controlled. ()

3. When water is released, it flows through wind turbines in the dam. ()

4. When turbines rotate in the dam, an electrical energy is generated. ()

Exercises 5

(A) Correct the underlined words:

1. The energy that is produced by wind turbines is called hydroelectric energy. (.....)

2. Wind turbines produce more electricity when the wind blows from the front of its blades. (.....)

3. Greenhouses convert radiant energy that is come from the Sun into light energy that is used to plant crops which grow in warm climates. (.....)

(B) What happens if ..?

The number of wind turbine blades decreases.

.....
.....

(A) Cross out the odd word :

1. Water - Wind - Coal - Sun. (.....)

2. Solar car - Hand mixer - Solar panel - Greenhouse. (.....)

3. Gasoline - Coal - Natural gas - Windmill. (.....)

(B) Compare between water turbines and solar panels in the table below :

P.O.C	Water turbines	Solar panels
1. Source of energy that is used to operate it:		
2. The produced energy :	energy	 energy and energy.

3. Look at the figure, then put (✓) or (×) :

1. Water in the area (A) can be used in rotating water turbines. ()



2. Water in the area A has no kinetic energy. ()

3. Water in the area B may evaporate in the presence of sunlight. ()

4. When water evaporates in both areas A and B, it never return back to the river. ()

Model Exam

(A) Write the scientific term of each of the following:

1. Main energy which is produced from both electric mixer and manual mixer. (.....)

2. Huge bodies in the space made mostly of hydrogen and helium gases. (.....)

3. A mill that uses the power of flowing air to generate electricity. (.....)

4. A turbine in which the kinetic energy of moving water is used to generate hydroelectricity. (.....)

(B) Give a reason for the following :

Dams are built on rivers.

.....
.....

(A) Correct the underlined words :

1. Thermal energy and sound energy are produced from the Sun and reach the Earth. (.....)

2. When air blows into the wind turbine with a large force, the blades spin slower. (.....)

3. Solar panels use sound energy to generate electricity. (.....)

4. During the flowing of river's water downhill, the chemical potential energy of water is converted into kinetic energy. (....)

(8) What happens if....?

You look directly at the Sun.

.....

.....

B (A) Put (✓) or (×) :

1. Both wind movement and water flow has kinetic energy.()

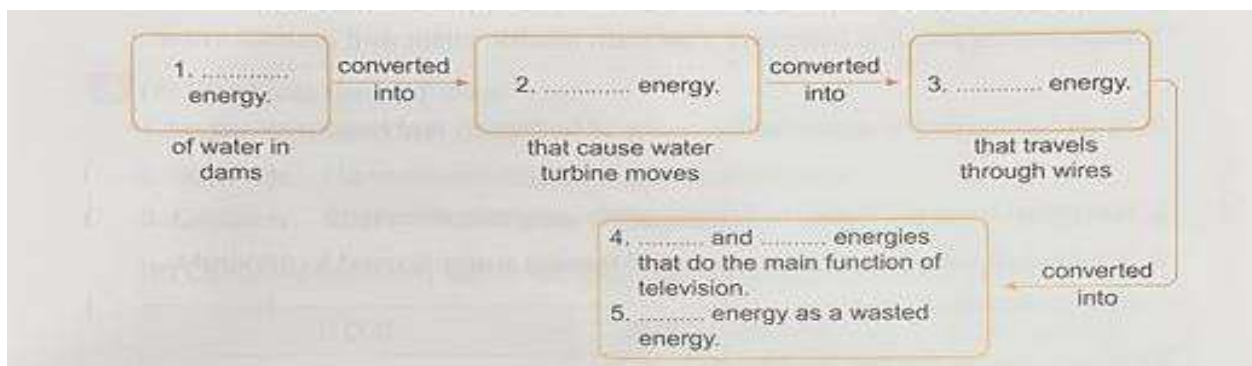
2. The Sun does not have a solid surface. ()

3. Wind is a renewable energy resource. ()

4. The flow of water can't be controlled to generate electricity in dams. ()

(B) Complete the following energy chain of a television by using the words between brackets:

(Electrical - Sound - Thermal - Potential - Light - Kinetic)



(A) Choose the correct answer:

1. In the water cycle, water then itbefore falling in the form of rains.

- a. freezes - evaporates
- b. evaporates - condenses
- C. evaporates - freezes
- d. condenses - evaporates

2. The solar energy is converted into energy in greenhouses.

- a. electrical
- b. sound
- c. thermal
- d. potential

3. The reason of flowing of river water downhill is the force

- a. pushing
- b. friction
- c. gravitational
- d. electrical

4. Some types of lamps depend on as a renewable energy resource in order to do its function.

- a. sunlight
- b. petrol
- c. coal
- d. natural gas

Compare the following table :

	Used energy	Produced energy
1. 	 energy	Light energy and energy
2. 	Kinetic energy	 energy
3. 	 energy	 energy

Unit 4

Shifting surfaces

By Miss: Wesam Jad
concept 4.1

Breaking down and moving rocks



- The Earth's surface contains (Landscapes around us that contain many landforms)



Factors that can change The Earth's

-These factors can change landforms through a cycle of processes.

Weathering —————> **Erosion** —————> **Deposition**

1 2 3

1-Weathering	Breaking down of rocks into small pieces
2-Erosion	Moving weathered rocks from one place to another.
3-Deposition	Dropping of weathered rocks (sediments).



- This cycle of processes can produce new landforms

By Miss: Wesam Jaid
Examples



- 1- Sandcastle: the disappearance of a part of it or all of it after few hours, due to the transportation (erosion) of the sand particles from its place to another by the effect of water and wind (this is natural erosion for sandcastles and coasts.).

-Sand is formed by breaking down (weathering) of some types of rocks into smaller particles.

- 2- Formation of Canyons: They are deep valleys carved by flowing water (long time)

Valley : is a lowland between mountains

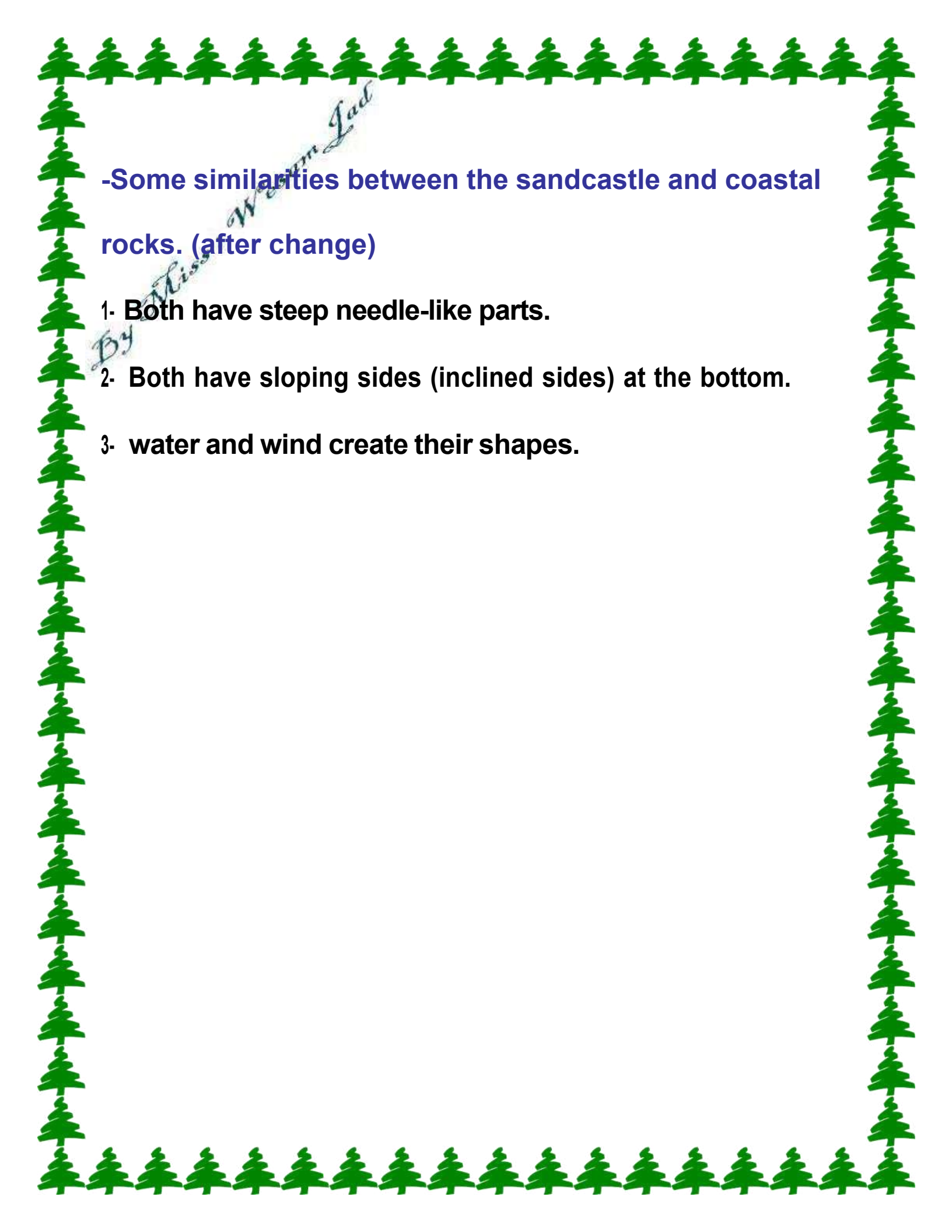
- Canyons has needle-like parts and slopes at the sides, its formed by the effect of water.



3- Formation of Delta and sand dunes.

-Some changes of Earth's surface can be very fast and other changes can be very slow (takes hundreds and millions of years)

Fast changes	Slow changes
They are observed in a sandcastle It may completely disappear in few minutes as a result of its hitting by the sea waves.	They are observed in a coastal rocks over time There may be some little difference in its shape after many years if some parts break off.
	



By Miss Wynn-Jad

-Some similarities between the sandcastle and coastal rocks. (after change)

- 1- Both have steep needle-like parts.**
- 2- Both have sloping sides (inclined sides) at the bottom.**
- 3- water and wind create their shapes.**

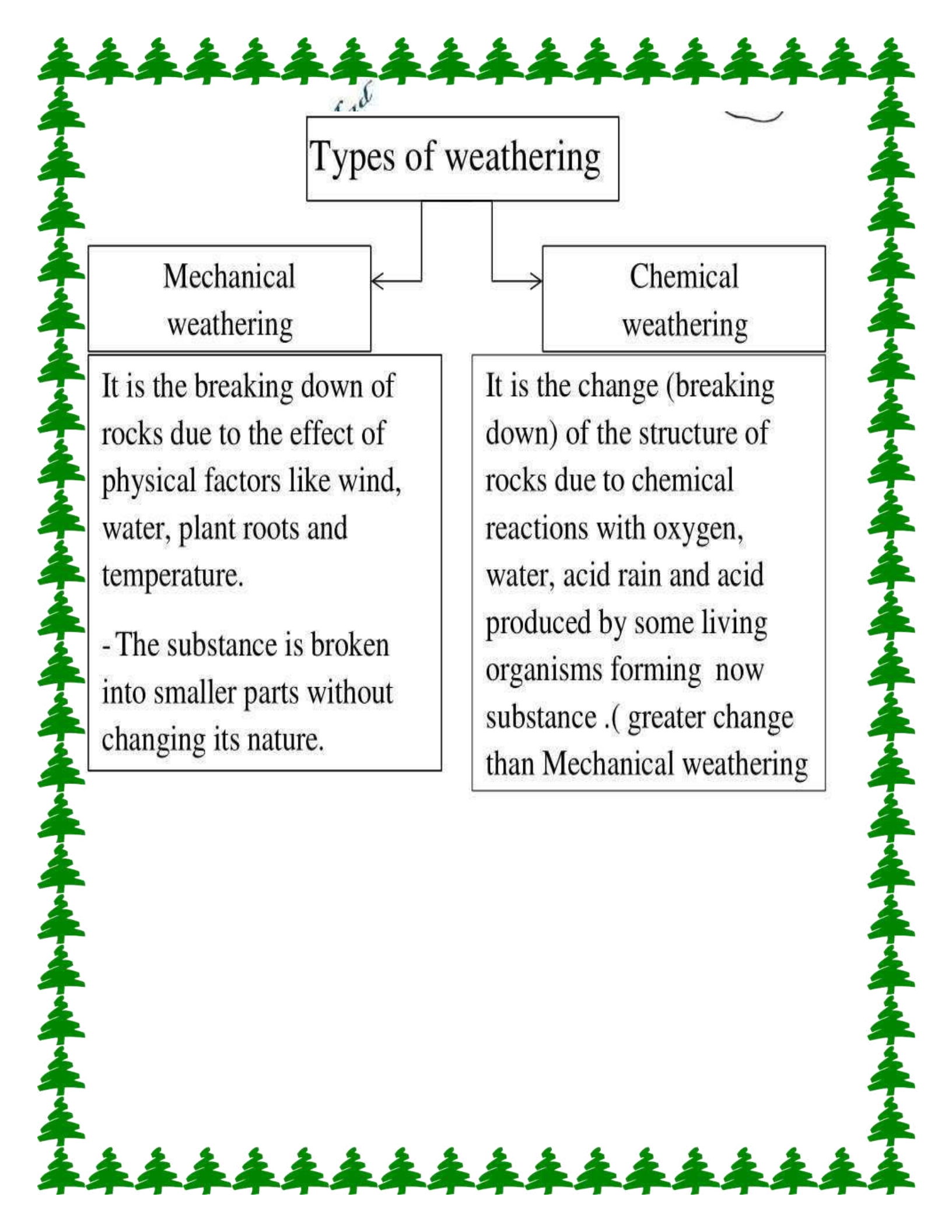
Weathering

The difference between weathering and weather

weather	Weathering
It's the condition of atmosphere at a specific time and place	It's the breaking down of rocks on earth's surface into smaller (tiny) pieces (slow)
Factors affecting on it : Temperature, wind , rains	Factors causing it: Wind and water
It help us to decide what to wear and when we go outside.	It can change the shape of earth's surface over time

-The effect of weathering (you can see it in many observations) (hard to see it during occurrence)

- 1- Breaking of statues.
- 2- Removing of paints of buildings.
- 3- Pulling a wave to the sand of seashores.



Types of weathering

Mechanical weathering

It is the breaking down of rocks due to the effect of physical factors like wind, water, plant roots and temperature.

- The substance is broken into smaller parts without changing its nature.

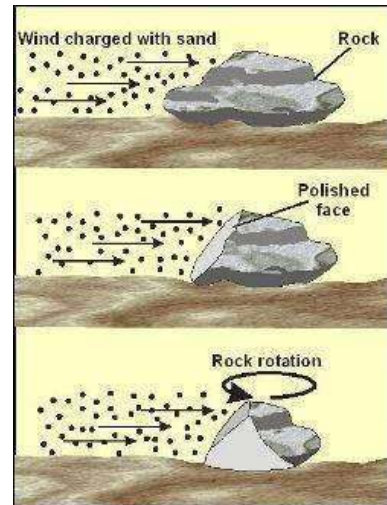
Chemical weathering

It is the change (breaking down) of the structure of rocks due to chemical reactions with oxygen, water, acid rain and acid produced by some living organisms forming new substance. (greater change than Mechanical weathering)

The role of physical factors in mechanical weathering

1- The role of wind in mechanical weathering

Steps



- A- Wind pushes the sand from a place another.
- B- Friction occurs between sand and rocks.
- C- Rocks are broken down.

2- The role of water in mechanical weathering

Steps



- A- Water runs over rocks.
- B- Water dissolves some substance in rocks.
- C- Rocks are broken down.

3- The role of plant roots in mechanical weathering

Steps



- A- Plants roots grow inside the cracks of rocks.
- B- Cracks become wider.
- C- Rocks are broken down.

4- The role of temperature in mechanical weathering



Steps

- A- Water flows into the tiny cracks of rocks.
- B- When the temperature gets very cold, water freezes forming ice that expands and makes the cracks of rocks become wider.

- C- When the temperature increases, the ice melts, so water fills newly formed wide cracks again.
- D- The cycle freezing of water and melting of ice continues until Rocks are broken down.

5- The role of factors in Chemical weathering

A- The role of oxygen in Chemical weathering :

Its reacts with iron of some rocks forming red-colored rust, this reaction can weaken rocks and break them down easily.



B- The role of water in Chemical weathering:

When water dissolves minerals in a rock, the dissolved minerals combine again forming new shapes as in limestone caves.



C- The role of acid rain in Chemical weathering

When the acid rain fall on rocks, it can dissolve minerals found in these rocks, causing the breakdown of rocks.

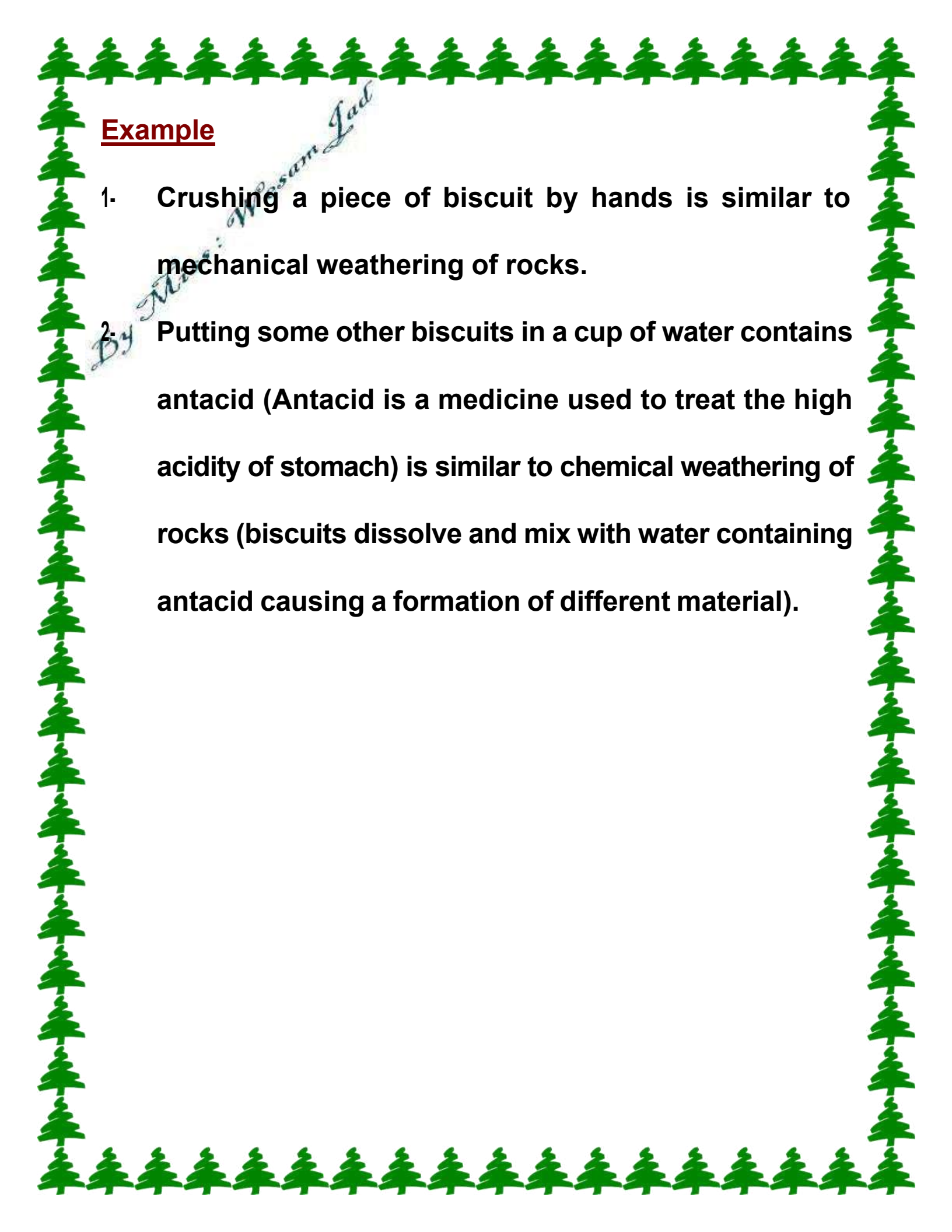


By Miss. Weem Jael

D- The role of acid produced by some living organisms (Lichens) in Chemical weathering.
Some tiny organisms called (Lichens)
(tiny plants) produce acids on rocks that dissolve minerals found in these rocks and break them down.



Scientists use models to recreate the weathering process to understand it better, because weathering takes along time in real life, and the rocks we can see now have been weathered over hundreds of years.



Example

- 1- Crushing a piece of biscuit by hands is similar to mechanical weathering of rocks.
- 2- Putting some other biscuits in a cup of water contains antacid (Antacid is a medicine used to treat the high acidity of stomach) is similar to chemical weathering of rocks (biscuits dissolve and mix with water containing antacid causing a formation of different material).

Erosion

It is the process in which the small particles (sediments) of sand, soil and rocks are moved to other places by wind, water and gravity.

- Sediments settle on the surface of land or the bottom of water bodies such as lakes and seas after being eroded.



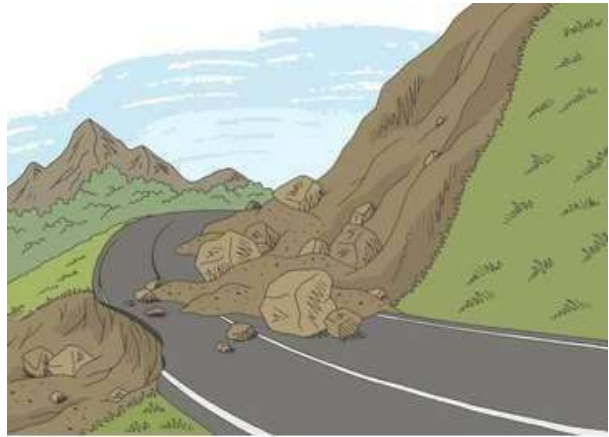
1. Action of wind erosion

A- gentle wind may carry sand grains for a short distance (about 1 meter), while stronger winds and hurricanes carry them for a longer distance.

2- Action of water erosion



- a) Rivers and floods carry sand, soil and rocks downstream.
- b) Sea waves pull sand away from beaches.
- c) Rain washes away the soil of farms that locate beside downhill.



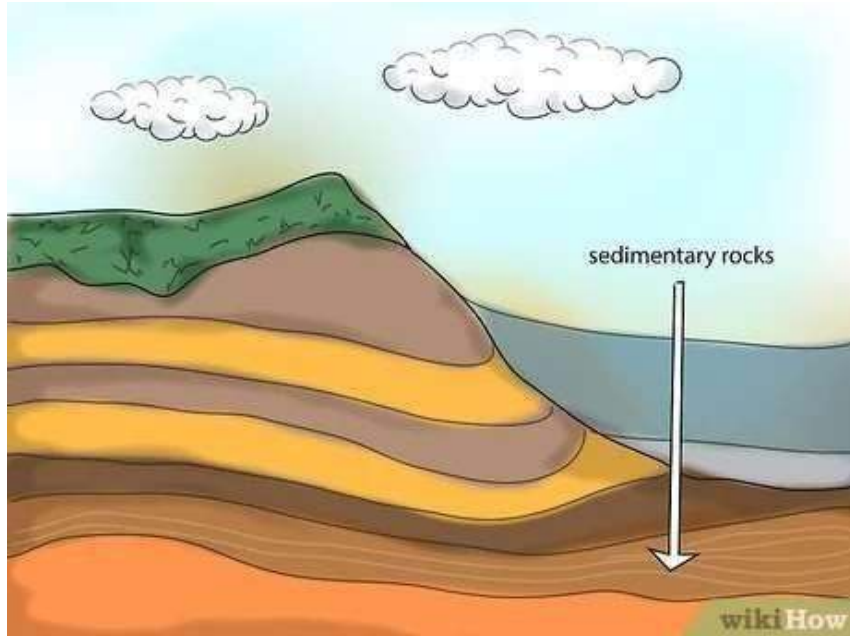
3- Action of gravity erosion

The broken weathered rocks in a mountain can be pulled down at mountainsides by the effect of gravity.

During a storm or a rockslide, erosion can happen quickly but in general, erosion happens slowly.

Formation of sedimentary rocks

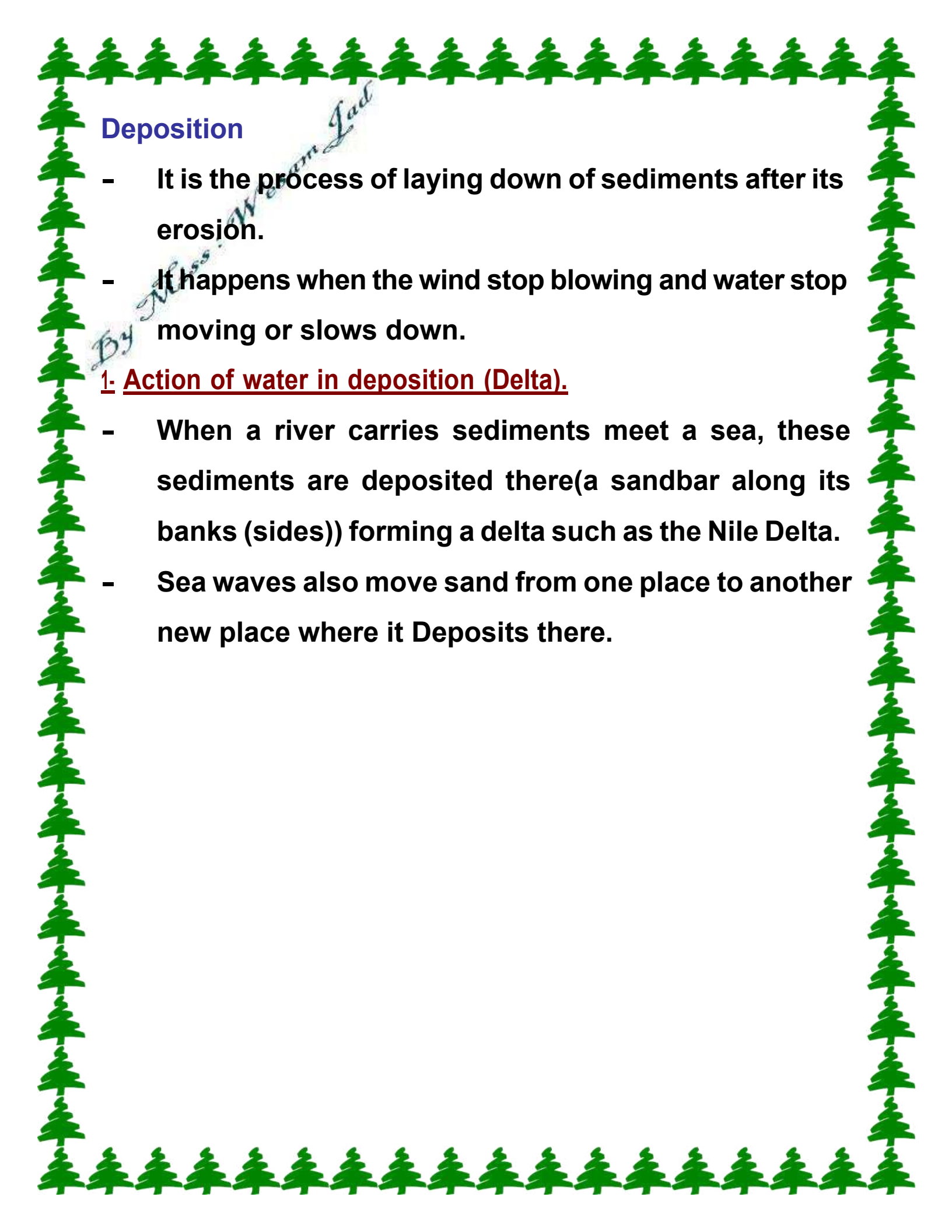
- 1- Sediments are mixed with mud, remains of plants and animals at the bottom of ocean, and in deserts forming layers.



- 2- Over long period of time, more and more layers press down forming sedimentary rocks.

You can see the evidence left by erosion after hundreds, thousands or millions of years from its occurrence.

- Glaciers are rivers of ice or snow that move slowly over the Earth's surface.
- Glaciers can help in erosion as they pick up and carry large rocks and soil.



Deposition

- It is the process of laying down of sediments after its erosion.
- It happens when the wind stop blowing and water stop moving or slows down.

1. Action of water in deposition (Delta).

- When a river carries sediments meet a sea, these sediments are deposited there(a sandbar along its banks (sides)) forming a delta such as the Nile Delta.
- Sea waves also move sand from one place to another new place where it Deposits there.

Delta

By Miss: Wesam Jaid



It is a fan-shaped (triangle-shaped) mass of mud and other sediments that forms where a river enters a large body of water such as sea and ocean.

2. Action of wind in deposition (Sand dunes) (sand hills)

Weak winds	Strong winds
They can form small sand dunes Example : Sand dunes on a beach. 	They can form large sand dunes Example: -sand dunes in: Western desert in Egypt Rub 'AL Khali in the Arabian peninsula. 

Erosion and deposition are linked processes, erosion does not occur in one place without deposition in another, and vice versa.

Exercises

1

(A) Correct the underlined words :

1. The deep valley that is carved by following water, is know as coastal rock. ()
2. The force of water and wind cause artificial erosion. ()
3. Canyons are formed due to fast changes. ()

(B) What happens when ...?

Water flows for many years between mountains.

.....

2

(A) Put (✓) or (×):

1. Both of sandcastles and canyons can be formed in few hours. ()
2. There are some similarities between sandcastles and coastal rocks. ()
3. Canyons have sloping at sides like that of coastal rocks. ()

(B) Give a reason for the following:

Sandcastle on a seashore may disappear in few minutes.

.....

.....

1

(A) Correct the underlined words :

1. The movement of sediments from one place to another, is know as deposition. ()
2. Weather is the breaking down of rocks on Earth's surface into tiny pieces. ()
3. Plant leaves grow inside the cracks of rocks which become wider. ()

(B) What happens when ...?

Water in cracks of rocks freeze and melt several time.

.....

.....

1

(A) Put (V) or (*):

1. Water may cause mechanical and chemical weathering.()
2. Chemical weathering could occur due to the acid that is produced from lichens or present in some rains. ()
3. Limestone caves are formed due to friction between sand and rocks. ()

(B) Give a reason for the following :

Plant roots play an important role in mechanical weathering.

.....

.....

3) Classify the following examples in the table below :

1. Rusting of an iron statue.
2. Formation of limestone cave.
3. Break down of rocks by plant roots.
4. Break down of a rock statue by wind.
5. Break down of rocks by acid rain.

6. Dissolving minerals of rocks by acids of lichens.

Mechanical weathering	Chemical weathering
.....	
.....	
.....	
.....	
.....	
.....	

1

(A) Put (✓) or (×):

- Crushing a piece of biscuit by hands can represent a type of chemical weathering. ()
- The shape and structure of an iron statue are changed due to rusting process. ()
- Limestone caves formed within few hours. ()

(B) Give a reason for the following :

Dissolving biscuits in water containing antacid considered as a chemical weathering.

.....

.....

2

(A) Complete the following sentences :

1. The weathering makes greater changes than weathering.
2. Chemical and mechanical weathering can be caused by which on freezing turned into ice.
3. If the color of a statue changes and it is broken into small pieces, this means both types of happened to it.

(B) What happens if... ?

A piece of cookies is placed in a cup of water containing antacid.

.....

.....

Classify the following factors that causing weathering in the table below :

- | Factors cause mechanical weathering | Factors cause chemical weathering |
|--|--|
|

.....

.....

.....

.....

..... |

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.....

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.....

..... |

1

(A) Correct the underlined words

1. Weathering process followed by deposition process in reshaping Earth's surface. ()
2. Sand grains can be carried for a short distance by strong wind. ()
3. When many layers of sediments pressing down each others over a long period of time, sand dunes are formed. ()

(B) Give a reason for the following :

Sedimentary rocks are formed over a long period of time.

.....

.....

2

(A) Put (✓) or (×):

1. You can see the reshaping of Earth's surface during its occurrence . ()
2. If there is no erosion process, there is no disposition process in another place. ()
3. Sedimentary rocks are present in the bottom of oceans, lakes and in deserts. ()

(B) What happens when ...?

The gravity acts on broken weathered rocks at the top of a mountain?

.....

.....

3

Study the following two figures of sand grains, then put (✓) or (×) below :



Figure (1)



Figure (1)

1. The action of water erosion appears in figure (1). ()
2. Sedimentary rocks do not appear in both figure (1) and (2). ()
3. Gentle wind causes the deposition of sand grains in figure (1). ()
4. Both figures (1) and (2) show sand dunes that are formed as a result of wind deposition. ()

1

(A) Correct the underlined words :

1. Small hills of sand found in a desert are known as sedimentary rocks. ()
2. Erosion process means that wind or water break down rocks. ()
3. Erosion process is usually followed by weathering process. ()

(B) Give a reason for the following :

If there is no erosion process there is no deposition process in another place.

.....

.....

2

(A) Put (✓) or (×):

1. After deposition of eroded materials it may wear down again by wind or water. ()
2. Erosion and deposition are two linked processes. ()

3. Both of small sand dunes and sedimentary rocks need few days to be formed. ()

(B) What happens if ...?

Weathering process doesn't occur.

3 Study the following two figures, then put (v) or (x) below :



Figure (1)



Figure (2)

1. Figure (1) represents a triangle-shaped delta. ()
2. Figures (2) occurs due to the deposition of sediments and mud in a desert. ()
3. Formation of figure (1) takes longer time than formation of figure (2). ()
4. Water erosion play an important role in formation of sand dunes that present in figure (2) ()

Model Exam

2 (A) Write the scientific term of each of the following :

1. The disappearance of a sandcastle as a result of its hitting with the sea waves. ()
2. It is a type of caves that is formed when dissolved minerals of rocks combine again in new shapes. ()
3. Process in which the moving sediments are dropped in a new place. ()
4. A hill of sand created by the wind. ()

(B) What happens if ...?

A red-colored rust is formed on some rocks.

.....

.....

2 (A) Choose the correct answer :

1. As a result of breaking down of , sand is formed.
a. rubber. b. plastic. c. rocks. d. glass

2. The breaking of rocks into smaller particles without changing their properties is called

- a. mechanical weathering. b. chemical weathering.
c. deposition. d. erosion.

3. The deep narrow valley with slopes at its sides and often with water stream flowing through it is known as a

- a. canyon. b. mountain. c. hill. d. river.

4. Lichens produce on rocks that dissolve minerals found in these rocks.

- a. oxygen. b. acids. c. water. d. rain

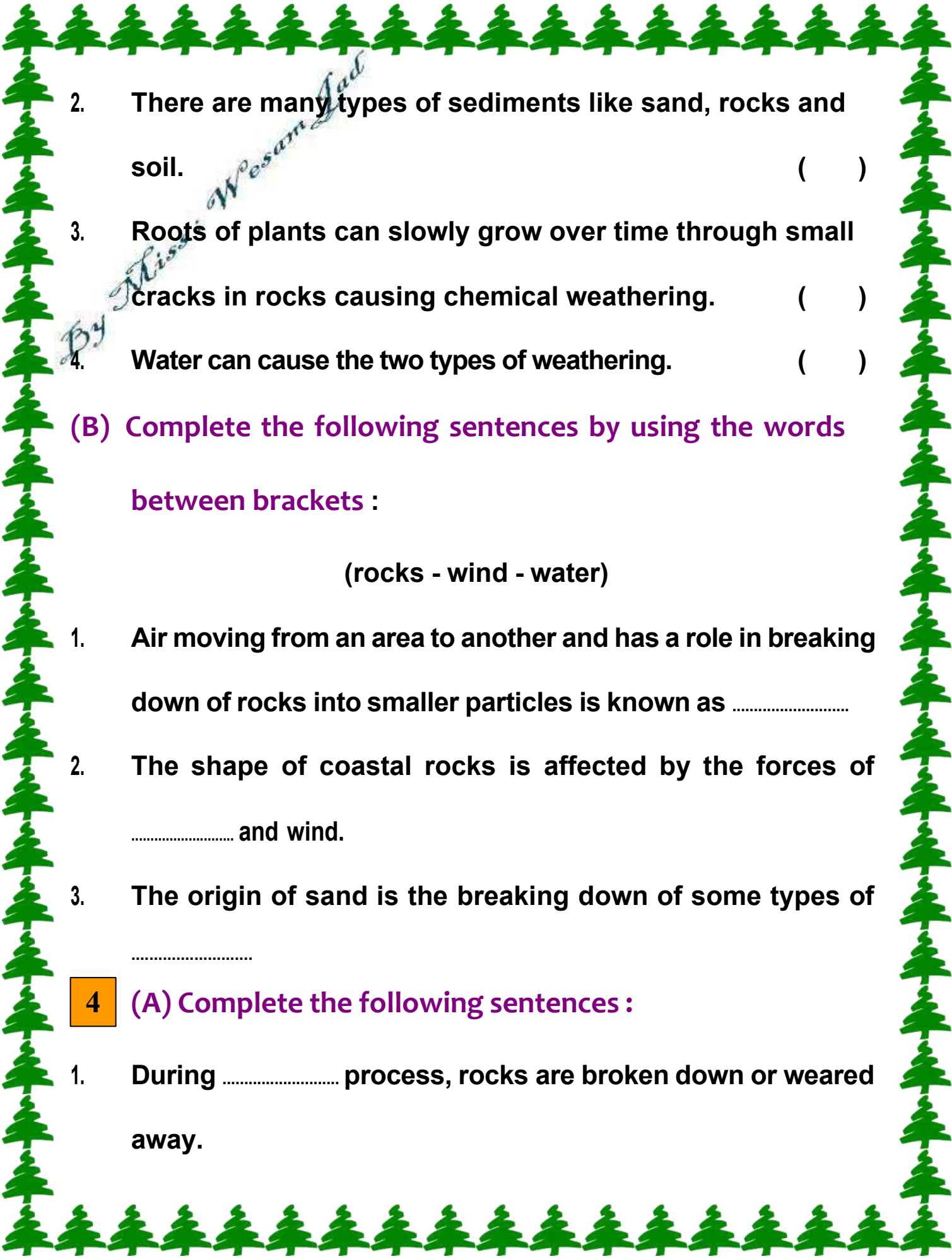
(B) Give a reason for the following :

Water play an important role in the formation of limestone caves.

.....
.....

3 (A) Put (V) or (x) :

1. All changes that occur on the Earth's surface take hundreds of years. ()

- 
2. There are many types of sediments like sand, rocks and soil. ()
3. Roots of plants can slowly grow over time through small cracks in rocks causing chemical weathering. ()
4. Water can cause the two types of weathering. ()

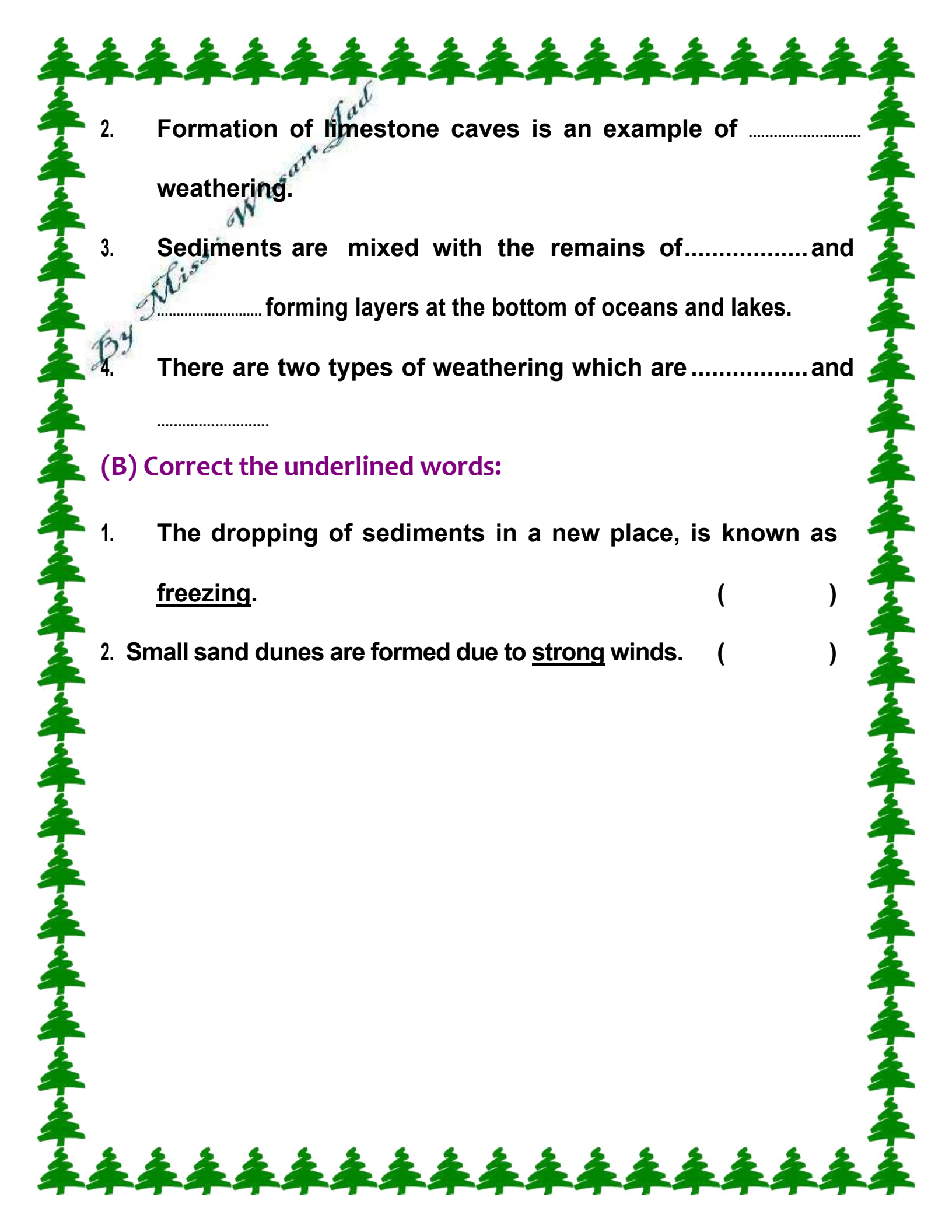
(B) Complete the following sentences by using the words between brackets :

(rocks - wind - water)

1. Air moving from an area to another and has a role in breaking down of rocks into smaller particles is known as
2. The shape of coastal rocks is affected by the forces of and wind.
3. The origin of sand is the breaking down of some types of

4 (A) Complete the following sentences :

1. During process, rocks are broken down or weared away.



2. Formation of limestone caves is an example of
weathering.

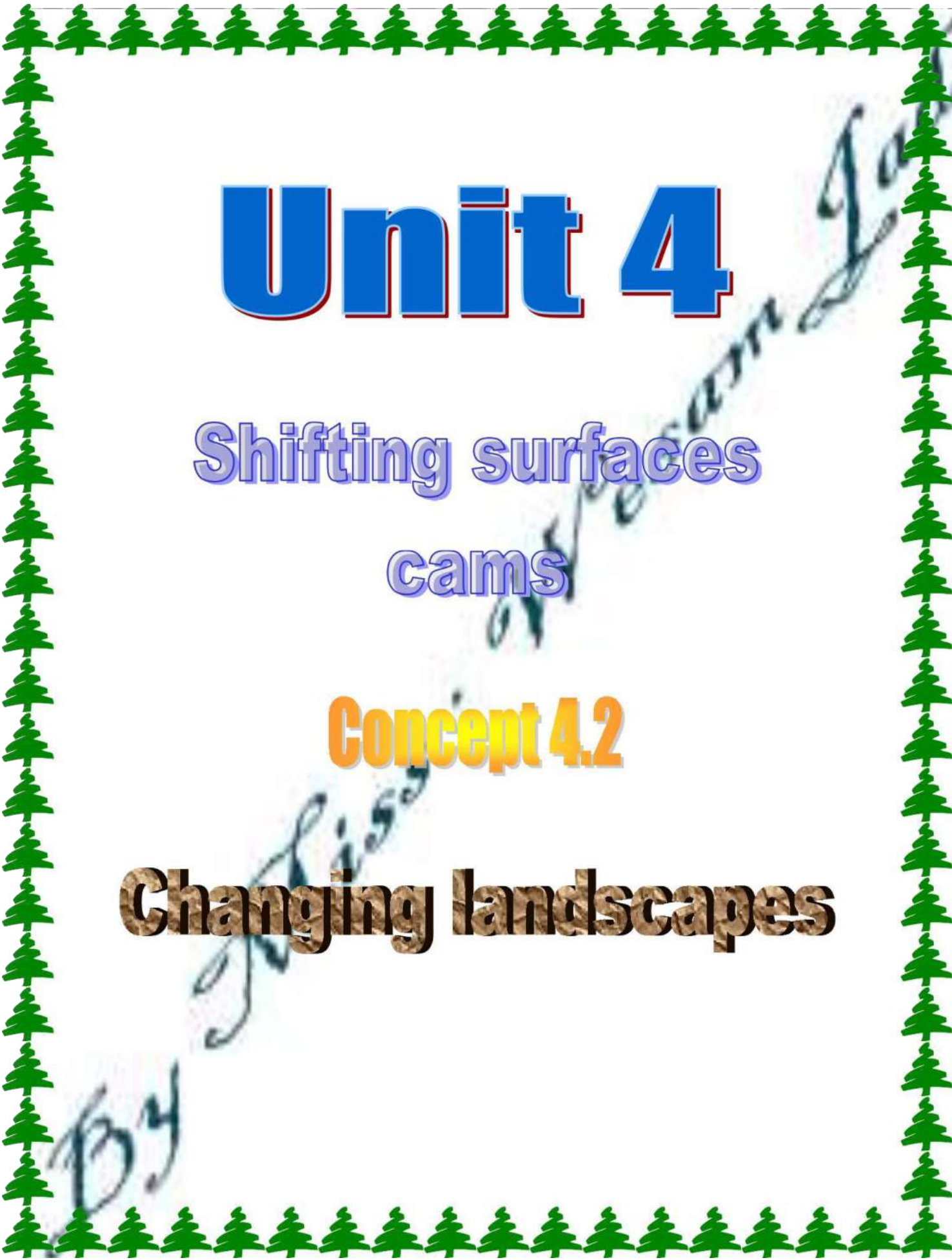
3. Sediments are mixed with the remains of.....and
..... forming layers at the bottom of oceans and lakes.

4. There are two types of weathering which areand
.....

(B) Correct the underlined words:

1. The dropping of sediments in a new place, is known as
freezing. ()

2. Small sand dunes are formed due to strong winds. ()



Unit 4

Shifting surfaces
cans

Concept 4.2

Changing landscapes

-Landforms such as: canyons, dunes, delta, mountains and valleys.

- In a rainy day small landscapes (school) can change like the large landscapes (nature) due to river movement.

P.O.C	School landscape	large landscapes in nature
Weathering process	Weathering of small rocks in the playground.	Big rocks of a mountain were broken off.
Erosion process	Small canyons in the land of the school.	Large canyon eroded by a river.
Deposition process	Patch of sand at your school playground.	The river makes new landform from sediments.

It might be useful to recognize signs of weathering, erosion and deposition (because it may help in building houses in safe places.)

- People must not build a house on a hill that is eroding or very close-to a river as it causes erosion and deposition of the house.

There are some changes happen for the landscapes this changes may take short time and some others take long time

- 1- Examples of changes take a short time (fast changes)
mudslide is a very quickly change in the landscape due to flooding rain.



- 2- Example of changes take a long time (slow changes)
the changes in a landscape that contains a river and Mountains (the river worn away the rocks and the wind and the weather break down the rocks)

How will this landform change over the next 100 years?
(two changes may happen)

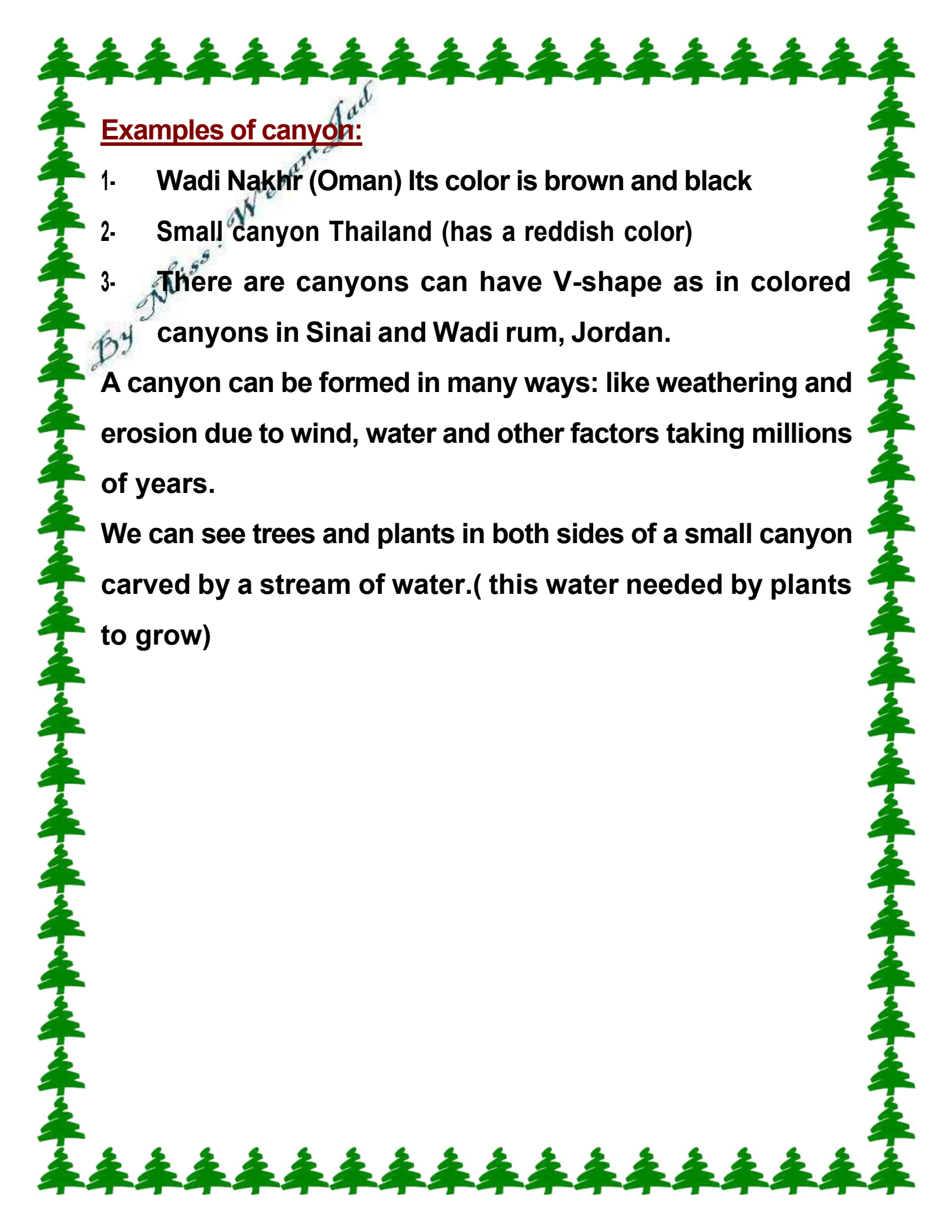
- 1- The river may get wider and the curves get bigger
- 2- The river may dry up leaving a small canyon between mountains.

Canyons and Valleys

P.O.C	Canyons	Valleys
Picture		
Similarities	Formed by rivers and streams (flow through the lowest point)	
Differences	areas that were eroded in Mountains - (deep valleys) -have high walls, great depth, narrow, steep and consist of many layers of rocks.	A lowland area between mountains. -have gently sloped slides -wide -usually surround a wide flat plain.

Geologist: is the scientist that studies the rocks of the earth to learn about living organisms existed there long ago.





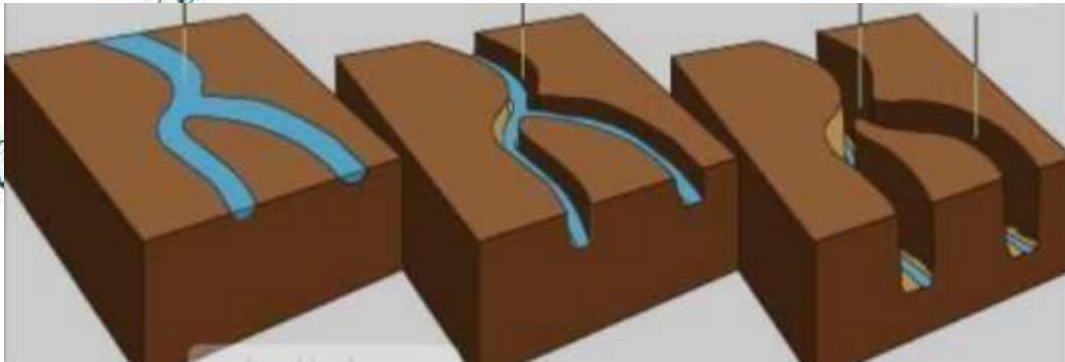
Examples of canyon:

- 1- Wadi Nakhr (Oman) Its color is brown and black
- 2- Small canyon Thailand (has a reddish color)
- 3- There are canyons can have V-shape as in colored canyons in Sinai and Wadi rum, Jordan.

A canyon can be formed in many ways: like weathering and erosion due to wind, water and other factors taking millions of years.

We can see trees and plants in both sides of a small canyon carved by a stream of water.(this water needed by plants to grow)

Formation of Canyons



1- Gravity pulls rainwater downhill forming small streams.



2- Streams join together and form a bigger Stream (river).



3- Big streams or rivers causes strong erosion which carve out rocks forming valleys (get deeper and turn into canyons).

The shape of a valley depend on several factors:

- 1- The types of rocks.
- 2- The speed, age and size of river that form the valley.
 - Big stream or rivers cause more erosion than small stream.
 - Rivers that flow fast cause more erosion than rivers with slow flow.

Grand canyon

-The most famous canyon in the world.

- It is located in United States of America, very large and steep, contains many layers of rocks and river in its bottom.

Formation of Grand canyon



- 1- Over long period of time, the water of the river there flowed so quickly due to traveling of the river down a steep slope.



- 2- The water of the river(fast flow) eroded the rock and cut them deeply and carry them away that leads to the formation of the grand canyon.

Delta formation

By Miss Wesam Jad



- 1- Stream or rivers which flow fast carry sediments which called silt (is made of very fine bits of sand, clay or rock materials).



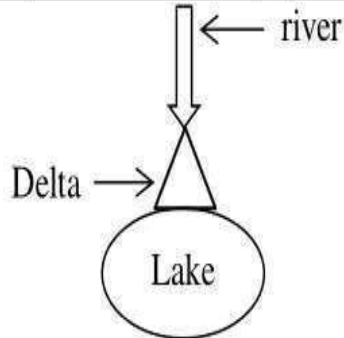
- 2- The river carries more and more sediments until the river water become full of sediments.



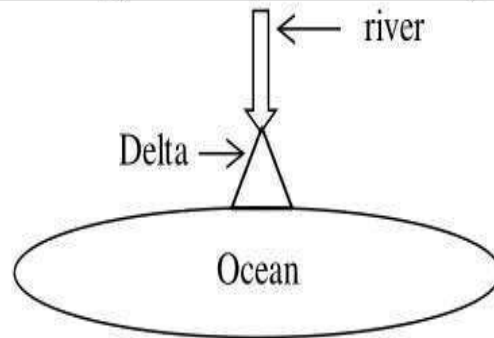
- 3- When the speed of the river water decrease, it drops the sediments (silt) forming deltas.

Types of deltas

1-Formed when fast flowing water (river) enters the still water (do not move) (lake).



2-Formed when fast flowing water (river) enters the slower flowing water (ocean or sea).



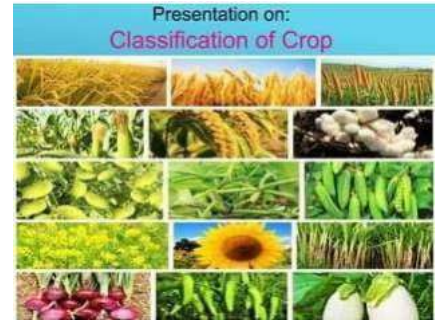
- Deltas formed by deposition process and large wetlands formed there.
- Plants which grow in wetlands (deltas) increase the deposition process, because plants can slow down the river water and its roots can help in trapping sediments.

The Nile River Delta

- Is the most famous deltas in the world.
- Has a triangular shape and it lies between and the northern coast of Egypt.



- It was formed in Egypt as a result of the rapid flow of the Nile River, which travels a distance of about 6,600 kilometers to pour into the Mediterranean sea.
- It covers over 20,000 square km in Egypt, and it is characterized by the presence of fertile soil that allows the cultivation (planting) of different types of crops.



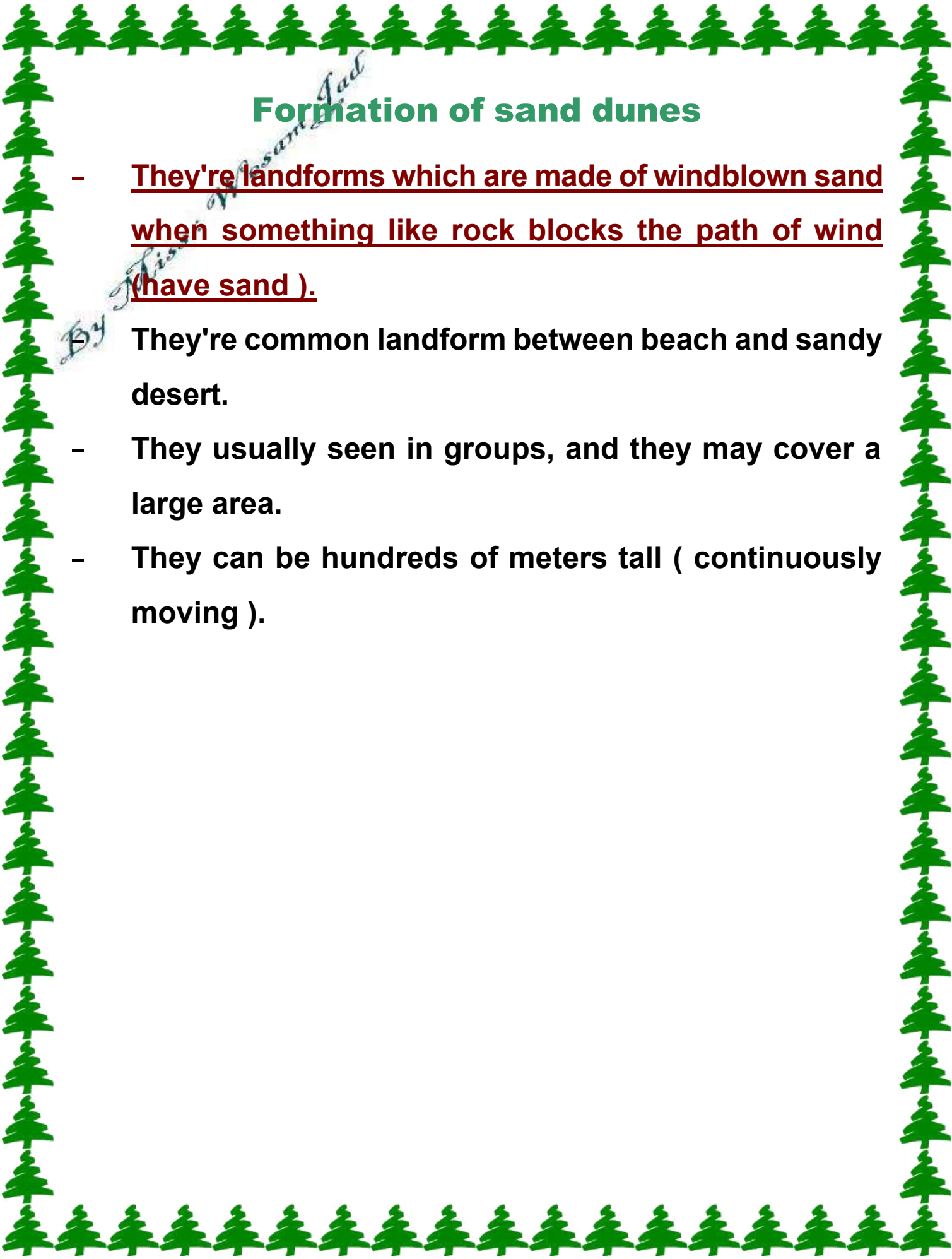
Wind erosion



- 1- When wind blows across the land, it picks up sand and other rock particles and carries them along.
- 2- When this flying sediment hits a rock, it wears down that rock.
- 3- This process carves(change the shape) the rock into different shapes.

Sand dunes

- Sand dunes are created by erosion and processes at the same time.



Formation of sand dunes

- They're landforms which are made of windblown sand when something like rock blocks the path of wind (have sand).

By *Thiruvalluvar*
They're common landform between beach and sandy desert.

- They usually seen in groups, and they may cover a large area.
- They can be hundreds of meters tall (continuously moving).

Sand dunes movement



1- When wind blows across a dune, sand grains erode away from the side that wind is coming from.



2- The sand grains carried by the wind are collected along the slope of the dune.



3- When the sand reach the top, the dune forms a barrier to the wind, and then the sand grains roll down the other side.

-The distance that the sand travels depend on the force of the wind.

-The way that the sand moves depends on the direction of the wind.

- Each layer of rocks is called (formation), holding fossils of plants or animals.
- Geologists study these layers of sediments in rock formations to know how the landscapes looked like in the past.

Formation of Rock layers of wadi Al-Hitan

Wadi Al-Hitan : It's a landscape that was a part of sea, contains skeletons and different fossils found in fayoum governorate in the western desert in Egypt.



-Fossils are old prints and remains of dead bodies in rocks.

-How this landscape changed over time?

1- When rocks were weathered, tiny pieces broke off forming sediments that sediments that floated away.



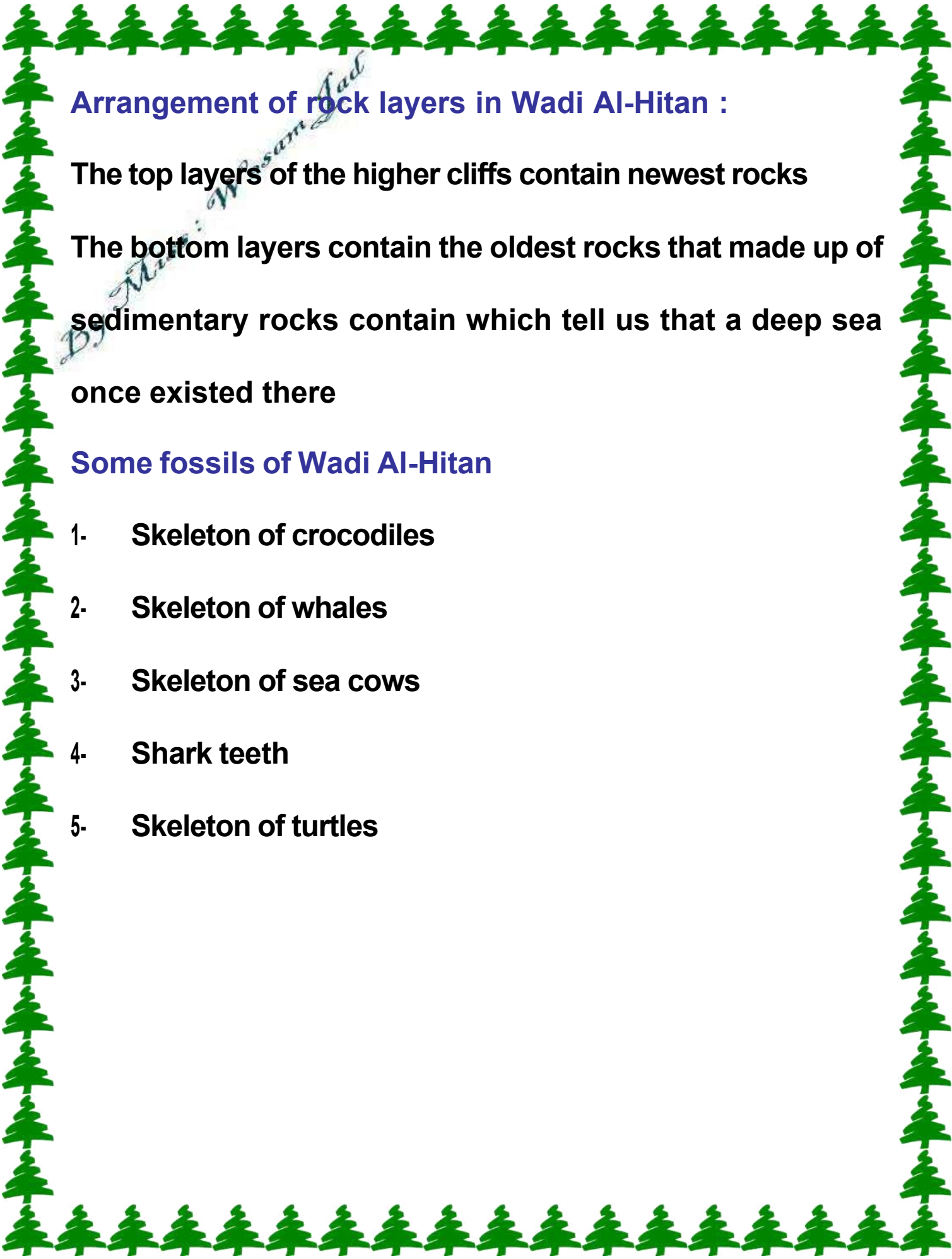
2- Sediments built up in layers at the bottom of a sea that covered all of northern Egypt 40 million years ago.



3- As the sea moved out, it left thick layers of



3- later, these layers of sediments formed sedimentary rocks such as limestone and sandstone.



Arrangement of rock layers in Wadi Al-Hitan :

The top layers of the higher cliffs contain newest rocks

The bottom layers contain the oldest rocks that made up of sedimentary rocks contain which tell us that a deep sea once existed there

Some fossils of Wadi Al-Hitan

- 1- Skeleton of crocodiles**
- 2- Skeleton of whales**
- 3- Skeleton of sea cows**
- 4- Shark teeth**
- 5- Skeleton of turtles**

Exercises

1

(A) Choose the correct answer:

1. has brown and black colors.

a. The Small Canyon.

b. Wadi Nakhr.

c. The Colored Canyon.

d. Wadi Rum.

2. are formed by the effect of water stream.

a. Mountains.

b. Dunes.

c. Hills.

d. Canyons

3. Rivers can make new lands from sediments by the effect of
..... process.

a. mechanical weathering.

b. chemical weathering.

c. deposition.

d. erosion.

(B) Give a reason for the following :

The sides of canyon at the beginning of its formation are
gently sloped.

.....
.....

2

(A) Put (✓) or (✗):

1. Canyons are formed due to erosion by water for a short period of time. ()
2. There is no trees or plants grow on the both sides of a canyon at the beginning of its formation. ()
3. The wall of canyons may be eroded by the effect of a river movement. ()

(B) What happens if ...?

More of rain water is running through a small canyon again.

.....

.....

3

Look at the following pictures, then complete the sentences below :



Picture (A)



Picture (B)

1. Rains in picture can turn the flat land into the landform that is present in picture

2. If a lot of rain falls on the landform in picture , its gently sloped sides will get deeper.
3. Water in picture can gather in one stream and form a river.
4. Landform in picture is considered as a small canyon at the beginning of its formation.

1 (A) Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Rounded and small rocks.	a. is a special type of valleys that has steep sides. b. are formed due to the effect of deposition process.
2. Mudslide	c. is a landform that is formed quickly due to flooding of rain.
3. Canyon	d. are formed due to the effect of weathering process.

1. 2. 3.

(B) Give a reason for the following :

Canyons may be formed as a result of river streaming.

.....
.....

2

(A) Correct the underlined words :

1. Canyons can take hundreds of years to be formed. ()
2. Big streams cause more deposition than small streams. ()
3. Canyons are example of fast changes of landscapes. ()

(B) What happens if ...?

The fast flow of water eroded a lot of sediment of a mountain and carry them away for a long period of time.

.....

.....

3

Look at the following pictures, then choose the correct answer :



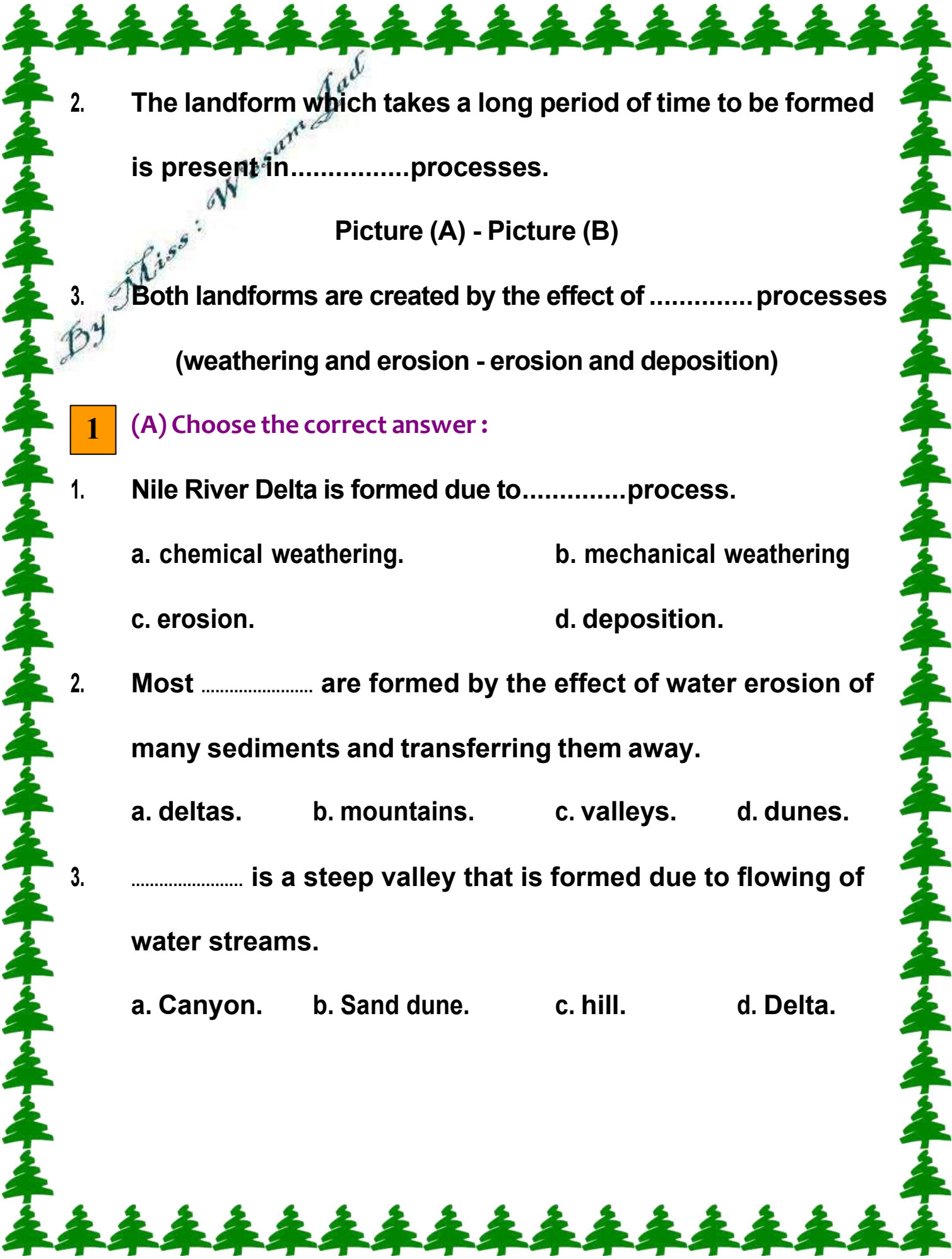
A mudslide Picture (A)



A canyon Picture (B)

1. The landform which represent a very quickly change in the landscape is present in

Picture (A) - Picture (B)

- 
2. The landform which takes a long period of time to be formed is present in.....processes.

Picture (A) - Picture (B)

3. Both landforms are created by the effect ofprocesses
(weathering and erosion - erosion and deposition)

1 (A) Choose the correct answer :

1. Nile River Delta is formed due to.....process.
- a. chemical weathering. b. mechanical weathering
c. erosion. d. deposition.
2. Most are formed by the effect of water erosion of many sediments and transferring them away.
- a. deltas. b. mountains. c. valleys. d. dunes.
3. is a steep valley that is formed due to flowing of water streams.
- a. Canyon. b. Sand dune. c. hill. d. Delta.

(B) Give a reason for the following :

Plants that grow in the wetlands of deltas have an important role in formation of those deltas.

.....

.....

2 (A) Correct the underlined words:

1. Deltas are formed by weathering process. ()
2. Dunes are lowland areas which have gently sloped sides.()
3. Small canyon is formed due to the flowing of wind through the flat land. ()

(B) What happens if ..?

The speed of the river water decreases.

.....

.....

3 Look at the opposite figures, then answer the question below :

Do you think that a delta will form in the area A ?

(Give a reason for your answer)

.....

.....



1

(A) Complete the following sentences using the words below :

(decreases - erosion - increases)

1. Wind in desert can change the shape of rocks by..... process.
2. When a river meets a sea, the speed of river's water and may cause formation of a delta.
3. When the amount of rainwater..... , the sides of canyon may get deeper.

(B) Give a reason for the following :

Sometimes we can observe sand dunes in front large rocks of desert.

.....
.....

2

(A) Put (✓) or (×):

1. Dunes are special type of valleys which is formed due to wind erosion. ()
2. Deltas may contain fertile soil which is suitable for cultivating many crops. ()
3. Canyons are formed by weathering and erosion of rocks for a long period of time. ()

(B) What happens to ...?

The sand in a desert when wind blows by a great force.

.....

.....

3 Complete the sentences below pictures to show how these landforms are formed by writing "weathering process, erosion process or deposition process" :



A Canyon

1and
..... processes.



A Delta A

2 process.



Sand dune

3and
..... process.

1

(A) Choose the correct answer:

1. Formation of in Eastern Desert in Egypt is due to the movement of winds.

- a. valleys. b. canyons. c. sand dunes. d. deltas.

2. The oldest rock layers in Wadi Al-Hitan include all the following, except

- a. skeleton of sea cows. b. skeleton of giraffes.
c. large skeleton of whales. d. skeleton of crocodiles.

3. Among the landforms that depend on deposition process in their formation are

- a. sand dunes and deltas. c. sand dunes and valleys.
b. canyons and deltas. d. deltas and valleys.

(B) Give a reason for the following :

You can see a fossil of whale skeleton presents in the bottom layers of Wadi Al-Hitan formations.

.....
.....

Model Exam

1

(A) put (v) or (X):

1. A small canyon could be formed due to the effect of water stream on a flat land. ()
2. Wind can be considered one of the factors that cause weathering. ()
3. The walls of valleys are vertical and steep. ()
4. The force of gravity pulls rocks down the mountain sides causing its erosion. ()

(B) Give a reason for the following :

Mudslides represent a fast change in the landscape.

.....

.....

1

Cairo Governorate

Heliopolis Educational Zone

1 (A) Choose the correct answer :

Lichens produce on rocks that dissolve minerals found in these rocks.

- a. water b. rain c. acid d. oxygen

(B) Give reasons for :

1. Sound energy and thermal energy are considered as wasted energy in the blender.

2. Water is considered as a renewable resource of energy.

(C) 1. What are the factors that affect the shape of the valley.

1.

2.

2. Explain : The law of conservation of energy.

2 (A) Put (✓) or (X) :

The movement of sediments from one place to another is known as weathering.

()

(B) What happens when ... ?

1. The sunlight falls on solar panels.

2. A river carries sediments meet a sea.

(C) 1. Mention the disadvantages of using fossil fuel to produce energy :

1.

2.

2. Complete the following energy chain of the electric heater :



3 (A) Write the scientific term :

Landforms that are made of windblown sand when something like rock blocks the wind. ()

(B) Complete :

Forces of _____ and _____ are responsible for the disappearance of sandcastles.

(C) 1. Classify the following into biofuel or fossil fuel :

- Coal. ()
- Natural gas. ()
- Grass and corn. ()
- Wood. ()

2. Explain : The role of oxygen in the chemical weathering.

3. Compare between :

Points of comparison	Water turbine	Solar powered calculator
Source of energy that is used to operate it.	_____	_____
The produced energy.	_____	_____

4 (A) Correct the underlined word :

Mechanical weathering is the change of the structure of rocks due to chemical reactions. ()

(B) Complete :

_____ have great depth, steep and narrow, while _____ have gently sloped.

(C) 1. Write some causes of pollution in the big cities :

- _____
- _____

2. What is meant by deposition?

3. Write how this landform is formed by writing the name of the processes :

- _____
- _____



A canyon

2**Cairo Governorate****Helwan Educational Zone****1 (A) Complete the following sentence :**

The break down of coastal rocks takes period of time.

(B) Write the scientific term :

1. Mirror is used in cooking food by solar energy. (.....)
2. It is a phenomenon in which the Earth's temperature increases when carbon dioxide gas increases in the air. (.....)
3. It is a hill of sand created by the erosion and deposition of the wind-blown sand. (.....)
4. It is the process of breaking down large rocks into smaller particles. (.....)

2 (A) Correct the underlined word :

The walls of valley are very steep and narrow. (.....)

(B) Answer the following questions :

1. What is the output energy from electric blender ?

2. Mention one example for :

1. Renewable resource of energy :
2. Landform is formed by deposition process :
3. Factor causes chemical weathering :

3 (A) Choose the correct answer from between brackets :

1. cause erosion of sea's beaches. (Wind – Gravity – Sun – Waves)
2. Sand dunes in Western Desert of Egypt are formed as a result of
(floods – wind – waves – streams)

(B) What happens when ...?

1. Operate the solar panels.
.....
2. Consume the fossil fuel in large amounts.
.....
3. Sea waves hit a sandcastle.
.....

4 (A) Put (✓) or (X) :

1. The shape of the valley doesn't be affected by speed of the river and type of the rock. ()
2. There are new substances formed by mechanical weathering. ()

(B) Give reasons for :

1. Mars rover Curiosity operated for a long period of time on Mars without any need to be recharged.
.....
2. Oil is nonrenewable resource of energy.
.....
3. The color of some rocks changes into red.
.....

3

Cairo Governorate

Al-Shorouk Educational Zone

1 (A) Write the scientific term :

A type of valley.

{ }

(B) Give reasons for :

1. There is a change in energy when burning wood.
.....
2. Biofuels are renewable sources of energy.
.....

(C) What happens when ... ?

1. Oxygen reacts with iron rocks.
.....
2. Sediments laying down.
.....

2 (A) Complete the following statements :

There are two types of weathering which are and

(B) Answer the following questions :

1. Determine the function of rover Curiosity.
.....
2. Give examples on biofuels and fossil fuels :
Biofuels :
Fossil fuels :
3. Mention one different between : The formation of dunes and formation of delta.
- Sand dunes formed by
- Delta formed by
4. Mention the different between : Weathering and deposition
- Weathering :
- Deposition :

3 (A) Choose the correct answer :

1. A canyon is a type of
 a. valley. b. river. c. mountain.
2. moving soil from one place to another.
 a. Weathering b. Erosion c. Deposition

(B) Show the energy pathway from input to output in :

1. TV.

2. Hair dryer.

(C) How were the chemical weathering and mechanical weathering similar ?**4 (A) Put (✓) or (X) :**

1. Deltas are formed by weathering. ()
2. Oxygen reacts with iron in rocks to create yellow colored rocks. ()

(B) What happens when ... ?

1. Increase the amount of carbon dioxide in air.
2. The radiant energy enters the greenhouse.

(C) Give a reason for the following :

Weathering and erosion change landforms.

4**Giza Governorate****Al-Agouza Educational Zone****1 (A) Complete the following :**

..... is the process that sediments move from one place to another.

(B) Give reasons for :

1. The rusting of iron in rocks.
2. Hydroelectric dams are built on rivers.
3. Putting a solar panels on Curiosity rover.
4. Fossil fuels are nonrenewable energy resources.

2 (A) Write scientific term :

They are deep valleys carved by flowing water.

{ }

(B) 1. Mention important of :

1. Concave mirror.

2. Solar heater.

2. Mention the energy transformation in the following :

1. Washing machine.

2. Electric bulb.

3 (A) Put (✓) or (X) :

1. Sand dunes are formed in desert by wind.

{ }

2. Coal can be used to produce electrical energy.

{ }

(B) What happens if ... ?

1. A river meets the sea.

2. The charging of toy's battery is run out.

3. The marine organisms are buried under Earth for millions of years.

4 (A) Choose the correct answer :

1. The wasted energy in hair dryer is energy.

a. chemical

b. thermal

c. sound

2. is the oldest biofuel.

a. Wood

b. Natural gas

c. Gasoline

(B) Mention the type of weathering in the following :

1. Formation of limestone caves.

2. The breaking down of rocks by wind.

3. The breaking down of rocks by plant's roots.

5**Giza Governorate****Al-Haram Educational Zone****1 (A) Choose the correct answers :**

1. The condition of atmosphere including temperature, wind and rains is known as

- a. weather. b. weathering. c. erosion. d. deposition.

2. Wadi Nakhr in Oman is formed because water move away by the effect of erosion.

- a. sunlight b. wind c. sediments d. mountains

(B) Correct the underlined words :1. Coal is the main source of most energies on the earth's surface. (.....)2. The high cost of producing energy in windmills is one of its advantages. (.....)3. In the chemical weathering, the chemical structure of rocks doesn't change. (.....)**2 (A) Choose from column (B) what suits it in column (A) :**

(A)	(B)
1. Sand dune.	a. A process in which the sediments are dropped in a new location by the action of wind, water and gravity.
2. Deposition.	b. A process in which small broken rocks move from a place to another by the help of wind or water.
	c. It is the landform that is formed by erosion and deposition of sand in sandy desert environment.

1. 2.

(B) Mention one example for the following :

1. Fossil fuel :

2. Renewable resources :

3. Factor causes mechanical weathering :

3 (A) Complete the following sentence :

There are two types of weathering which are weathering and weathering.

(B) Write the scientific term :

1. A form of energy produced from the electric lamp and affects our eyes. (.....)
2. Natural resources of energy, that take a short period of time to be renewed. (.....)
3. They are deep valleys carved by flowing water. (.....)
4. A land area that is formed by deposition process when a river enters a sea. (.....)

4 (A) Put (✓) or (X) :

Water and wind are artificial forces that are responsible for the erosion of sea coasts. ()

(B) 1. Give reasons for :

- a. Sometimes the fuel indicator of a car goes down.
.....
- b. It might be useful to recognize signs of weathering, erosion and deposition.
.....

2. What happens ... ?

- a. If sunlight falls on solar panels.
.....
- b. To a small canyon if it rained a lot and water ran through it for a longer time.
.....

6

Alexandria Governorate

Borg Al-Arab Educational Zone

1 (A) Complete the following sentence :

The process of erosion occurs before the process of

(B) Mention two uses of solar energy :

1.
2.

(C) What happens when ... ?

1. The flow of water over the sand.
.....
2. Fast flow of water on rocks for a long period of time.
.....

2 (A) Write the scientific term :

It's a fan shaped "triangular shape" of mud and some of sediments that forms when the river enters a large body of water. (.....)

(B) Give reasons for :

1. The occurrence of global warming.
2. Generators are important in electric power stations.
3. Delta land has high fertile soil.
4. The disappearances of sandcastle.

3 (A) Put (✓) or (X) in front of the following statements :

1. Chemical weathering has greater effect than mechanical weathering. ()
2. The rust resulting from the chemical weathering of iron increases the hardness of rocks. ()

(B) 1. Compare between :

Fossil fuel and biofuel according to the type of energy resource.

a. Fossil fuel : b. Biofuel :

2. What is meant by ... ?

Deposition :

4 (A) Choose the correct answer from the brackets :

1. has high-sloped at the sides. (Valley – Dune – Canyon – Mountain)
2. Wadi Nakhr exists in (Jordan – Oman – Thailand – Egypt)

(B) Follow the energy chain arrangement in the washing machine :

Input : Output :

(C) Determine the type of weathering in :

The reaction of oxygen with iron in rocks.

7

Alexandria Governorate

East Educational Zone

1 (A) Complete the following :

Moving fragments of and sediments around is an example for erosion process.

(B) Write the scientific term :

1. A process that lays down the broken rocks. (.....)
2. Type of weathering occurs by plant roots grow in soil. (.....)
3. A substance release thermal energy when it burned. (.....)
4. The energy does not help contributing the job of the device. (.....)

2 (A) Cross the odd word :

Water turbine – Wind turbine – Washing machine

{ _____ }

(B) Mention :

1. One use of concave mirror.

2. An example for large sand dunes in the Arabian Peninsula.

3. One importance of greenhouses.

4. An example for a tiny plant-like produces acid that break down rocks.

3 (A) Put (✓) or (x) :

1. Sandcastle wrecked during a short period of time.

{ () }

2. Oxygen helps in breaking down rocks by chemical weathering.

{ () }

(B) What happens when ... ?

1. Water freezes and melts in the cracks of rocks many times for long periods.

2. Acid rains fall in the water of lakes.

3. The speed of river slows or stops, when river entering the sea.

4 (A) Choose the correct answer :

1. Dissolving minerals forming limestone cave is an example for _____

a. weathering. b. deposition. c. erosion. d. delta.

2. Steep valleys formed due to the flowing water erosion are called _____

a. delta. b. hills. c. sand dunes. d. canyons.

(B) Give reasons for :

1. The calculator has solar cells.

2. Wind is a renewable energy source.

3. Water helps in chemical weathering of rocks.

8

Qalyoubia Governorate

Science Inspectorate

1 (A) Write the scientific term :

The process of breaking down large rocks into small particles. (.....)

(B) Complete the following sentences :

1. The energy stored in batteries is energy.
2. Burning fuel is used as a source of energy.
3. The type of weathering in which the rocks are broken down due to temperature is known as weathering.
4. Canyons differ in their , texture and shape of rocks.

2 (A) Put (✓) or (X) :

Mechanical weathering causes change in shape of rocks without any change in their nature. ()

(B) 1. Give reasons for :

1. You feel warm, when you put your hands near a lighted electric lamp.

2. Lichens break down rocks as they grow.

2. What happens when ... ?

1. The remains of marine (sea) animals are decomposed under the Earth's surface.

2. A river enters a sea or an ocean.

3 (A) Choose the correct answer :

1. Weak winds can form small
 a. delta. b. mountain. c. sand dunes. d. canyon.
2. are lowland areas with gently sloped sides.
 a. Deltas b. Valleys c. Canyons d. Dunes

(B) Mention (Write) each of the following :

1. Output energy in hand bell :
2. Example for biofuel :
3. Name of the most famous canyons :

4 (A) Complete the following sentences by using following words :

(Delta – Hydroelectric dam)

1. is used to generate to electric energy.
2. is formed by deposition process.

(B) What is the function (importance) of each of the following :

1. Old wind mills.

2. Modern wind turbines.

3. Oxygen in chemical weathering.

9 Menoufia Governorate

Berkat El-Sabaa Educational Zone

1 (A) Choose the correct answer :

The breaking of rocks into smaller particles without changing their properties is called

- a. deposition. b. erosion. c. mechanical weathering.

(B) Give reasons for :

1. We must turn off lights that we do not need.

2. When you rub your hands together, you feel warm.

3. Iron in rocks may rust.

4. A sand dune may be formed in front a large rock in desert.

2 (A) Complete the following sentences :

Sand is formed due to breaking down of

(B) What happens ... ?

1. If a river carries sediments meet a sea.

2. If decomposition of remains of sea animals under the Earth's surface.

3. To the change of energy when you turn on the television.

4. If wind that is carrying sand particles hits a big rock.

3 (A) Put (✓) or (X) :

1. The nonrenewable resources of energy include coal, gasoline and oil. ()
2. The input energy in a hair dryer is the chemical energy. ()

(B) Correct the underlined words :

1. Light energy is stored inside the battery. (.....)
2. The solar energy produced from the moon. (.....)
3. Delta are formed by erosion and weathering processes. (.....)

4 (A) Complete the following sentences using the words below :**(winds – acids)**

1. Lichens produce on rocks that dissolve minerals found in these rocks.
2. The formation of sand dunes in Western Desert in Egypt is due to the movement of

(B) Mention the input and output energies of :

- | | | |
|---------------------|---------------|----------------|
| 1. Electrical bell, | Input : | Output : |
| 2. Electric iron, | Input : | Output : |
| 3. Electrical fan, | Input : | Output : |

10 Dakahlia Governorate**Science Inspectorate****1 (A) Choose the correct answer :**

Solar panels generate energy.

- a. solar b. light c. electrical d. chemical

(B) 1. Complete the following model to describe the hydroelectric energy.**2. Mention :**

Two examples of landforms formed by effect of erosion and deposition in Egypt are and

2 (A) Complete :

..... are the remains of weathered and eroded rocks that have been deposited.

(B) 1. What is meant by ... ?

1. Fossil fuels :

2. Acid rain :

2. What is the type of weathering ...?

1. Acids that produced by lichens :

2. Melting and freezing of water inside rock cracks :

3 (A) Put (✓) or (x) :

1. Earth's surface features are change by passing time. ()

2. Rivers can lead to weathering and erosion of rocks. ()

(B) 1. What is the result of increasing carbon dioxide in air ?

.....

2.1. Give one example of renewable energy :

2. Choose the odd word :

Water – Sun – Wind – Coal. (.....)

4 (A) Write the scientific term :

1. The process in which the laying down of sediments after their erosion. (.....)

2. The largest canyon in the world and it is from millions of years old. (.....)

(B) 1. Mention the input and output energy in table lamp :

The device	Form(s) of energy in	Form(s) of energy out
Table lamp		

2. What happens when ...?

Oxygen of our atmosphere reacts with iron in rocks.

.....

11**Gharbia Governorate****Science Inspectorate**

- 1** (A) Put (✓) in front of the right statement or (x) in front of the wrong one :

Deltas are formed as a result of deposition.

()

(B) Mention :

1. One example of biofuel.

2. The main source of energy on Earth's surface.

3. Types of weathering.

4. One factor of mechanical weathering.

- 2** (A) Put (✓) front of the right statement or (x) in front of the wrong one :

A canyon is a deep valley.

()

(B) What happens if ... ?

1. Coal is burned.

2. The amount of carbon dioxide increases in air.

3. Sediments dropped down.

4. A river carries sediments meet a sea.

- 3** (A) Complete the following :

1. Canyons are formed by flowing of rivers.

2. Moving sediments from one place to another is process.

(B) Give reasons for :

1. The importance of rover Curiosity.

2. You feel heat when you hold your hand near to a light bulb.

3. The importance of dams.

4 (A) Choose the correct answer :

- The formation of canyons takes
 a. few minutes. b. few hours. c. many years.
- The process of breaking down of rocks called
 a. erosion. b. weathering. c. deposition.

(B) Mention :

- One example of electric device,
- One example of fossil fuel.
- The main processes that change Earth surface.

12 Beheira Governorate**Science Inspectorate****1 (A) Complete :**

The process of collection and dropping of sediments on Earth's surface is called

(B) Classify the following types of fuel into renewable and nonrenewable :

- Wood :
- Natural gas :

(C) 1. Mention :

The wasted energy produced when operating a hair dryer.

2. What happens when ... ?

River water carrying clay sediments meets the sea.

2 (A) 1. Cross out the odd word :

Lichens – Water – Wind – Heat and cold.

(.....)

2. Explain :

The cause of acid rain.

(B) Compare between :

Sand dunes and canyons in terms of formation processes.

(C) 1. What is the importance of concave mirrors ?**2. Who am I ?**

A gas that causes acid rain due to its reaction with water vapor.

3 (A) Put (✓) or (x) in front of the following statements :

- Old windmills are used to generate electricity. ()
- The output energy of the electric blender is kinetic energy. ()

(B) Mention one evidence of the reaction of oxygen and water with minerals in the rocks ?

(C) 1. Write the scientific term :

Electricity generated from the movement of water. ()

2. What is meant by ... ?

Erosion:

4 (A) Choose the correct answer :

- One of the nonrenewable energy sources is
a. coal. b. water. c. wind. d. Sun.
- The canyon located in Egypt is
a. Small Canyon in Thailand. b. Wadi Rum.
c. Wadi Nakhr. d. Colored Canyon in Sinai.

(B) Rock erosion occurs under the effect of several factors. Mention one of them ?

(C) Determine the type of weathering (Mechanical or Chemical) in the following cases :

- Growth of plant roots in rocks. ()
- Dissolving of water for the minerals in rocks. ()

13 Ismailia Governorate

Science Inspectorate

1 (A) Choose the correct answer :

The formation of canyons takes
a. few days. b. few weeks. c. many weeks. d. many years.

(B) What happens if ... ?

- Turning on an electric lamp.
.....
- Lichens growing on rocks produce acids.
.....
- Water in cracks of rocks freeze and melt several times.
.....
- Sea creatures were buried under the Earth's surface over millions of years.
.....

2 (A) Write the scientific term :

The process of moving small particles of sediments to another place by wind and water. (.....)

(B) Give reasons for :

1. Water turbines are placed in waterfalls area.
.....
2. Formation of sand dunes on a beach.
.....
3. Iron in rocks may rust.
.....
4. Some electrical devices have solar panels.
.....

3 (A) Put (✓) or (X) :

1. When iron in rock rust, the rock becomes stronger. ()
2. A strong wind carries sediments for long distance. ()

(B) Compare between the following :

1.

Point of comparison	Mechanical weathering	Chemical weathering
One factor of :		

2.

Point of comparison	Hand bell	Electric heater
The produced energy :		

3.

Point of comparison	Coastal rock	Sandcastle
Types of change :	 change	 change

4 (A) Complete the following sentences using the words between brackets :

1. Sand is formed due to breaking down of (rocks – glass)
2. are deep valleys carved by flowing water. (Canyons – Sand)

(B) Mention :

1. The main source of energy.
.....
2. The stored energy in the battery.
.....
3. The process in which dropping of sediments occurs in a new place.
.....

14**Suez Governorate****North Educational Zone****1 (A) Put (✓) or (X) :**

Sand is formed by breaking down of rocks. ()

(B) Write the scientific term :

1. It is a process in which water changes into water vapor. ()
2. They are lowland areas in between mountains and gently sloped sides around rivers. ()
3. It is any substance which produces thermal energy on burning. ()
4. It is the breaking down of rocks on Earth's surface into smaller pieces. ()

2 (A) Put (✓) or (X) :

All canyons are similar in shape of rocks and colors. ()

(B) Complete the following sentences :

1. The input energy in an electric bulb is the
2. is the main source of energy in the Earth surface.
3. Sand dunes are formed by process and erosion process.
4. Disappearance of a coastal rocks is an example of change.

3 (A) Choose the correct answer :

1. The condition of atmosphere including temperature, wind and rains is known as
 a. weather. b. weathering. c. erosion. d. deposition.
2. are formed by the effect of the water stream.
 a. Mountains b. Dunes c. Hills d. Canyons

(B) Correct the underlined words :

1. Delta are formed when the speed of river water increases. ()
2. Fuel is the substance that produces electrical energy on burning. ()
3. Curiosity is a robotic vehicle that is designed to explore the surface of moon. ()

4 (A) Complete the following sentences using the words below :

(canyon – oxygen)

1. Chemical reaction between iron and causes its rusting.
2. The wall of are usually very high.

(B) Mention an example of :

1. Biofuel.

2. Renewable resource.

3. Type of weathering.

15 Port Said Governorate

Science Inspectorate

1 (A) Complete the following statement :

Coastal rocks are formed by a period of time.

(B) Give reasons for :

1. There is a change in energy when burning wood.

2. Smog of cars is very dangerous to human health.

3. Some rocks appear red.

4. It might be useful to recognize signs of erosion.

2 (A) Write the scientific term :

The process by which sediments drop down. (.....)

(B) What happens when ... ?

1. You hold your hand near to light bulb.

2. Cutting down trees.

3. Rocks are broken into smaller pieces.

4. Deposition can not affect landform.

3 (A) Put (✓) or (x) :

1. Canyon formed at a short period of time.

()

2. Gravity is a factor that causes erosion.

()

(B) Determine :

1. The input and output energies in greenhouse.

Input : Output :

2. The input and output energies in solar panels.

Input : Output :

3. One different between the formation of sand dunes and formation of delta.

Sand dunes :

Delta :

4 (A) Choose the correct answer :

1. The rust of rocks is caused by

a. oxygen. b. nitrogen. c. water. d. wind.

2. Sediments help create rivers

a. sand dunes. b. delta. c. dam. d. water.

(B) Mention the name of the following :

1. The main source of energy on the Earth surface.

.....

2. Rising the temperature of Earth.

.....

3. Break the rocks into pieces without any change in their structure.

.....

16**Fayoum Governorate****Science Inspectorate****1 (A) Choose the correct answer from the following :**

What is the process in which the landforms change due to weathering factors?

a. Expansion. b. Weathering. c. Erosion. d. Evaporation.

(B) Complete the following sentences :

1. The energy stored in food is energy.

2. is from renewable fuels.

3. Chemical weathering the structure of rocks.

4. Canyons may differ of each other in

2 (A) Put a sign (✓) or a sign (x) on the following statement :

Fast moving rivers can cause a lot of erosion.

()

(B) Write the scientific term :

1. Fuels that were formed from remains of plants and animals. (.....)
2. Material formed as a result of decomposition of sea creatures. (.....)
3. Landforms that form by the processes of erosion and deposition. (.....)
4. The pieces of weathered rocks that moved from their place. (.....)

3 (A) Complete the following sentences using the given words :

(mechanical weathering – chemical weathering)

1. Plant roots cause
2. The rust of rocks is caused by

(B) Give reasons for :

1. The waves causes the beach erosion.
.....
2. Burring fossil fuels has many risks to the environment.
.....
3. We should not waste or pollute water.
.....

4 (A) Cross out the odd words :

1. Valleys – Canyons – Deltas. (.....)
2. Deposition – Evaporation – Erosion. (.....)

(B) What happens when ... ?

1. The water was traveling down a steep slope.
.....
2. Turn on electric iron.
.....
3. Rivers run downhill with decreasing speed.
.....

17 Minia Governorate

Bani-Mazar Educational Zone

1 (A) Cross out the odd word :

Oxygen – Lichens – Plant roots – Acid rains. (.....)

(B) Correct the underlined words :

1. Watermill is turned when the wind flows. (.....)
2. When the river meets a sea a canyon is formed. (.....)
3. The wasted energy in electric lamp is the light energy. (.....)
4. Strong wind can form small sand dunes on the beaches. (.....)

2 (A) Complete the sentence :

_____ is nonrenewable resource of energy.

(B) Write the scientific term :

1. Energy that stored in food or batteries. (.....)
2. A process in which rocks broken down into smaller particles. (.....)
3. Any substance that produces thermal energy when it is burned. (.....)
4. They are deep valley that formed by flowing water. (.....)

3 (A) Put (✓) or (X) :

1. The Nile River Delta has a triangular shape. ()
2. Water and wind can't change Earth's surface. ()

(B) Give reasons for :

1. Hydroelectric dams are built on rivers.

.....

2. Formation of large sand dunes.

.....

3. Concave mirrors are used in cooking food.

.....

4 (A) Choose the correct answer :

1. All the following causing erosion, except
 a. water. b. wind. c. gravity. d. sunlight.
2. Deltas are formed by process.
 a. weathering b. digestion c. deposition d. photosynthesis

(B) What happens if ... ?

1. Lichens produce acid on rocks.

.....

2. Increasing the amount of carbon dioxide gas in air.

.....

3. Sunlight falls on solar panels. (according to energy change)

.....

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Luxor Governorate

Luxor Educational Zone

1 (A) Complete using the words between brackets :

Sand is formed due to breaking down of (wood – rocks – plastic)

(B) Give one example for each of the following :

1. Biofuel :

2. Fossil fuel :

(C) Classify the following to mechanical weathering or chemical weathering :

1. Oxygen reacts with iron of rocks which weaken rocks. (.....)

2. Plant roots grow inside the cracks of rocks. (.....)

2 (A) Cross out the odd word :

Wind – Water – Oil – Solar energy. (.....)

(B) Write the scientific term of the following :

1. It is the breaking down the rocks on Earth's surface into smaller pieces. (.....)

2. The energy produced from a battery. (.....)

3. It is any substance which produced thermal energy when it is burned. (.....)

4. A hill of sand created by the wind. (.....)

3 (A) Put (✓) or (X) :

1. Coal was formed from the sea animals remains. ()

2. The walls of valley are high and steep. ()

(B) 1. Give a reason for the following :

Thermal energy in a mobile phone is considered as a wasted energy.

2. In the table below, classify the following energies in the solar panel.

(Solar energy – Electrical energy)

Input energy	Output energy
.....	

4 (A) Choose the correct answer :

1. When a river meets a sea or lake a is formed.

a. canyon

b. delta

c. valley

2. Most energy chains start with the

a. moon.

b. Sun.

c. Earth.